*Henry C. Pearson, F. R. G. S., Founder*

*Edward Lyman Bill, Publisher*

*B. Brittain Wilson, Business Manager*

# INDIA RUBBER WORLD

*William M. Morse, Editor*

*Webster Norris, Associate Editor*

*D. C. McRoberts, Assistant Editor*

**Volume 91** | **November 1, 1934** | **Number 2**

## Contents

### Articles



### Departments



### Departments



Published monthly by Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y. Cable Address: ELBILL, New York. Subscription $3.00 per year postpaid in the United States; $4.10 per year postpaid to Canada; $3.50 per year postpaid to all other countries.



Other Bill publications are: *Drapery Profits, Premium Practice, Radio Merchant, Rug Profits, Sales Management, Soda Fountain,* and *Tires.*

INDIA RUBBER WORLD

*Published at 420 Lexington Avenue, New York, N. Y.*

**Volume 91** | **New York, November 1, 1934** | **Number 2**

# Measurement of Quality in Rubber Goods by Physical Tests[1]

**Arthur W. Carpenter**[2]

THE expression "measurement of quality" as applied to rubber goods seems at first thought to be quite definite; unfortunately it conveys to different persons widely divergent ideas. Engineers in dealing with various materials often interpret the word "quality" as being synonymous with strength. Such usage is quite common in the rubber industry, and stocks possessing high tensile strength may be designated as high quality. A rubber compounder, on the other hand, may consider the quality of a rubber compound to be related to the percentage of pure rubber contained in the mixture. Thus compounds having only small amounts of other materials added to the rubber would be considered high grade though they might be inferior in strength. Purchasers of rubber products have in the past shared both of these viewpoints, but today the more enlightened consumers understand the expression "high quality" to indicate the relative excellence of an article in performance of the intended service. This seems a more rational interpretation since, in the last analysis, satisfactory service is the prime objective and may or may not be affected by either great strength or high rubber content.

While quality of rubber articles in terms of strength or rubber content is comparatively easy to measure in the laboratory, and fairly satisfactory methods have long been more or less standardized, adequate laboratory evaluation of service behavior is quite another matter. Definition of quality on the basis of performance in service has therefore necessitated the development of new test methods. The older tests for particular properties which are still indispensable for the control of uniformity have been supplanted in product evaluation to a considerable degree by tests directly related to the service conditions. Just as the varieties of articles and types of service cover a tremendous field, so too these performance tests are

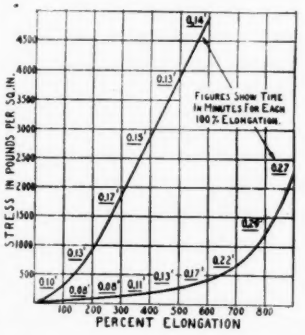



Fig. 1. Rate of Stretching of Dumbbell Specimens between One-Inch Bench Marks

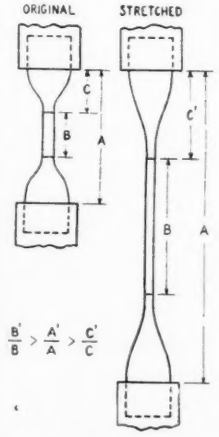



Fig. 2. Effect of Dumbbell Ends on Rate of Stretching between Marks

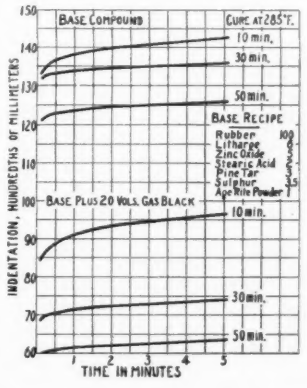



Fig. 3. Effect of Duration of Loading on Indentation Hardness

[1] *Ind. Eng. Chem.*, (Anal. Ed.), Sept. 15, 1934, pp. 301-308. Presented before the meeting of the Chicago Group, Rubber Division, A. C. S., Apr. 12, 1934.

[2] B. F. Goodrich Co., Akron, O.

exceedingly diverse and may be quite simple for some products or highly specialized and complex for others. Some rubber articles are really structures requiring as complicated engineering as the building of a skyscraper, and the play of forces within them in service may be more complex and less capable of complete analysis than the stresses in the skyscraper. Testing such products involves more than merely the measurement of quality of the rubber compounds. Careful and complete analysis of both the structure and the service is necessary, after which development of a suitable test is worthy of the very best engineering thought.

### Types of Physical Tests

The physical tests ordinarily made on rubber products may be considered as being in one of 2 classes, the first consisting of those which are designed to measure fundamental physical properties, and the second, those tests which aim to determine service value. Obviously no such classification can be rigid, for in many cases a certain particular physical property may govern the fitness of an article for service. The first class would include measurement of dimensions, of specific gravity, of tensile strength and ultimate elongation or the stress-strain relationship, of compressive strength and the relation between load and deflection, of hardness and resilience, of permanent set, color, dielectric strength, coefficient of friction, and the like. In the second class would be included tests for aging, adhesion, resistance to abrasive wear including tearing and cutting, fatigue tests of various kinds involving repeated applications of stress producing either extension, compression, or flexure, as well as a countless variety of service tests which represent attempts to imitate the actual service under laboratory conditions in such a way that accelerated results may be secured.

The need for laboratory tests capable of giving information rapidly from which the behavior in service of rubber articles can be reliably predicted and the difficulties which have arisen in such use of present tests have been frequently emphasized. Bierer and Davis[3] pointed out the failure of tests of the first class to fulfill the requirements of purchase specifications and discussed the value of performance tests in this connection. They dealt particularly with the various tests for abrasive wear, accelerated aging tests, and a flexing test. While the weaknesses of these performance tests are fully appreciated, they are nevertheless considered to represent advance over the older tests.

Dinsmore[4] has given a number of instructive examples showing the inadequacy and unreliability of the usual laboratory methods for the prediction of service performance. He selected stress-strain data, abrasion test results, and certain flexing tests, and referred to aging tests although various other tests might also, as he observed, have been included. He cited the variety of performance testing devices which have been developed in recent years as evidence that the need for better tests is well recognized and pointed out that such modifications as the work of Somerville and Russell[5] on testing rubber at higher temperatures and that of Somerville, Ball, and Edland[6] on autographic stress-strain curves of rubber at low elongations are steps in the right direction. Dinsmore further suggests that, since rubber is partly plastic and partly elastic, slow deformation emphasizes its plastic properties while fast deformation develops more elasticity. High temperatures appear to increase the plasticity effect at slow speed and elasticity effect at higher speeds. Degree of vulcanization is also an important factor. He considers it likely that this dual nature of rubber is important in many tests, mentioning particularly stress-strain, fatigue, adhesion, and possibly abrasion. Finally, he expresses another thought which seems especially worthy of elaboration and emphasis:

"More effective laboratory methods may result from careful mechanical analysis of the behavior of rubber products in service. Rubber chemists have naturally failed to appreciate the full value of mechanical studies but they must turn to the physicist for aid in their difficulties. A sound theoretical basis may serve materially to shorten the tedious search for laboratory and service correlation. Certainly the haphazard development of new tests must lead but slowly to progress."

It would ordinarily be supposed that the oldest tests used for rubber products would have been thoroughly investigated and completely analyzed from a mechanical point of view. Two of these tests which were probably carried over from the field of the testing of metals are the measurement of tensile strength and elongation and the determination of hardness. Both of these have been used for more than a quarter of a century by rubber men and have been studied extensively. The lack of completeness of these studies can be illustrated by some data which were recently secured. In measuring tensile strength and elongation, it has usually been agreed that either a uniform rate of application of load or a uniform rate of stretching is desirable for producing duplicable test conditions. Since machines for applying load uniformly would be considerably more complicated than those designed for uniform rate of jaw separation, the latter have quite generally been used. How serious any departure from uniform loading or uniform stretching might be in its effect on the final results is irrelevant in connection with the present question of mechanical analysis.

Presumably the tensile testing machines were intended to give uniform stretching since care has been taken in all specifications to require a uniform and standard rate of jaw separation. A study was made of the actual rate of the stretching of dumbbell rubber samples between one-inch bench marks when tested in a type L-6 Scott tester. The machine was first carefully checked under load to be certain that the speed of lower jaw travel was uniform and independent of load. Stop-watch measurements of the time required for each 100% elongation between the marks were made by 2 observers. The data are shown in Figure 1. The time for 100% increments of extension between the bench marks is not uniform for a high-rubber stock having low modulus, but increases from 0.08-minute at the start to a maximum of 0.29-minute. In the case of a high-modulus tread stock, the rate is very much more uniform. Evidently, then, the rate of elongation measured with bench marks and dumbbell samples is influenced by the modulus of the sample. It is believed that the explanation rests in the stretching of the enlarged ends outside of the bench marks. When under sufficient stress, these also yield, relieving the elongation of the portion between the marks. This effect is illustrated in Figure 2. While *A* increases to *A'*, *B* and *C* do not increase to *B'* and *C'* in the same ratio, and the extension of *C* lowers the rate of extension of *B*.

A simple study of 2 instruments for measuring indentation hardness again illustrates the lack of complete analysis in the case of even this very old test. It also adds weight to Dinsmore's view of the importance of the dual plastic and elastic nature of vulcanized rubber. Dif-

[3] Bierer, J. M., and Davis, C. C., *Trans. Inst. Rubber Ind.*, 3, 151-78 (1927).
[4] Dinsmore, R. P., *Ibid.*, 7, 407-14 (1932).
[5] Somerville, A. A., and Russell, W. F., *Ind. Eng. Chem.*, 25, 1096 (1933).
[6] Somerville, A. A., Ball, J. M., and Edland, L. A., *Ind. Eng. Chem.*, (Anal. Ed.), 2, 289 (1930).

TABLE I. COMPARISON OF A. S. T. M. AND DUROMETER HARDNESS

| Stock | Best Cure at 280° F. Min. | Samples at Best Cure: Tensile Strength Lb./sq. in. | Ultimate Elongation % | Modulus at 300% Elongation Lb./sq. in. | A. S. T. M. Hardness | Durometer Hardness | Cure, 30 Min. at 280° F.: A. S. T. M. Hardness | Durometer Hardness | Permanent Set, Stretched* |
|---|---|---|---|---|---|---|---|---|---|
| A† | 15 | 2,650 | 660 | 600 | 125 | 39 | 78 | 50 | 34 |
| B‡ | 45 | 1,570 | 400 | 950 | 69 | 59 | 75 | 57 | 60 |
| C§ | 30 | 1,070 | 425 | 650 | 69 | 56 | 65 | 58 | 25 |

*80% of ultimate.
† Stock A (parts by weight): rubber, 36.5; inner tube reclaim, 36.5; zinc oxide, 6.5; mineral rubber, 11.0; palm oil, 1.3; sulphur, 3.2; accelerator, 5.0; total, 100.0.
‡ Stock B: 100 parts A + 82.5 Georgia clay.
§ Stock C: 100 parts A + 82.5 Missouri clay.

ferences in relative hardness values were noted in an investigation of certain compounds when using the Shore durometer and the A. S. T. M. hardness tester. The results with 3 of these compounds are shown in Table I. It must be remembered that in the A. S. T. M. instrument the indenting point operates under a dead-weight load, and readings are not taken until after at least 30 seconds of weight application. The durometer, on the other hand, is a spring instrument, and the quickest possible and highest reading is taken. The scales of the 2 instruments read in reverse; that is, the higher durometer readings represent harder stock; while the higher readings of the A. S. T. M. instrument show softer stock. Thus the results on the 30-minute cures using the A. S. T. M. test show stocks A and B to be of substantially the same hardness; while stock C appears decidedly more hard. The durometer test, however, indicates that stocks B and C are of the same hardness and that both are harder than stock A. If we bear in mind that undercures, such as the 30-minute cure of stock B, should be more plastic than correct or overcures, such as those of stocks C and A, the differences with the 2 instruments can be readily explained on the basis of plastic flow of stock B, which affects the A. S. T. M. measurement, but not the durometer reading. This is confirmed by the readings at the best cures. A further check[7] was made using a high-rubber stock and a 20-volume gas black compound in 3 cures, measuring hardness with a Pusey and Jones plastometer, which is also a dead-weight indentation instrument. Readings were taken over a somewhat extended period. The results are shown in Figure 3. The curves for the undercured stocks (10 minutes at 285° F.) show plainly the effect of plastic flow, some of which persists even in the overcures (50 minutes at 285° F.) as shown by the slopes of these curves. Hardness of vulcanized rubber compounds thus appears to consist of 2 parts, one of which is due to resistance to resilient deformation and the other to resistance to plastic deformation. Some methods of measurement include both in the indentation hardness result, and other methods show only the resilient hardness depending on the duration of the application of the load.

The significance of this kind of analysis in making possible better correlation with service has been intentionally omitted from the discussion because much more work will be necessary before it can be fully evaluated. Surely, however, such analysis cannot help but give us better appreciation of the value of the tests which are made and a more accurate understanding of how to use the test data. We must not fail to realize the indirect nature of all laboratory tests, nor should we underestimate their value for comparative purposes even though direct correlation with service is not always clear. Certainly direct interpretation in terms of service value is not possible for tests such as determinations of stress-strain relationships, permanent set, and adhesion, except in some special instances. Yet what rubber technologist would be willing to have such useful tools taken from him and would be content to rely on imitations of service and on simple hand tests alone? Service evaluation or prediction represents a judgment on the part of the technologist, and all of the information possible, comparative and indirect, as well as direct data, must be assembled if the final estimate is to be a good one.

[7] Tronson, J. L., B. F. Goodrich Co., unpublished work.

### Difficulties in Correlating Laboratory and Service Results

The difficulties which are experienced in correlating laboratory test results with service performance must be attributed to one or both of 2 causes. Either the tests themselves are improperly designed or the results secured from the tests are not correctly interpreted. Improper design is a frequent consequence of hasty, unsound analysis of the service which fails to give full knowledge and appreciation of all the conditions and forces that are involved. A fundamental requirement of good testing is that the service to be measured shall be first completely and accurately defined before attempting the design of a test. A good example of the lack of such definition is found in the case of abrasive wear, particularly as applied to tread wear of tires. The various conditions and forces involved are so numerous and complex that we frankly admit our shortcomings in respect to their analysis. Yet we attempt to design laboratory abrasion tests and we carry on extensive road testing at enormous expense without really knowing what it is we are trying to measure. Possibly more time and money spent in determining just what road wear consists of and in establishing the relative importance of the various service factors might pay more dividends in the end than all of these expensive test programs. Proof of the serious inadequacy of present analyses of road wear factors is evidenced by the difficulties which different tire manufacturers have in checking one another's road tests, and by the fact that each manufacturer has elaborate sets of road test data which show that his tires are the best of all competitive brands. It is worthy of note that laboratory abrasion tests do correlate fairly well with service wear when the latter is simple enough to be analyzed readily or capable of being closely duplicated under laboratory conditions.

Improper design of laboratory tests may result also from failure to carry over into the test apparatus a proper balance of the conditions and forces known to exist in the service. This is often caused by the necessity of accelerating the investigation. Performance tests would fall short of their purpose if they required as long a time as the service life of the article. The acceleration of failure is secured usually in one or more of the following ways: (1) by increasing the severity and intensity of forces on the sample (higher pressures or loads, harsher abrasive surfaces, etc.); (2) by increasing the temperature; and (3) by increasing speeds. Through emphasizing certain of these individual factors, the normal balance of service conditions may be upset, both directly and, as is often not realized, indirectly, since change in one condition may cause resultant changes

in others. Obviously without such emphasis the test would not be accelerated. If the emphasized conditions are those which are principally responsible for the ultimate failure of the article and if the other factors which are involved are not important in contributing to the cause of failure even though they may be indirectly affected, reasonable success may be anticipated with respect to correlation of such tests with service. On the other hand, when the balance of the service factors is seriously disturbed in the test conditions, it is unlikely that good correlation can be obtained. The only alternative which remains then is to analyze the service completely and then to emphasize all factors in the same proportion.

In regard to interpretation of laboratory tests, it is not infrequent that attempts are made to apply test data to services that involve differences in conditions which are significant, but not fully appreciated. Here, again, the solution of the difficulties which arise must reside in more careful analysis of both the test and the service. It is also quite usual to encounter lack of understanding of the limits in precision of engineering data secured by test. Almost any of the performance tests serves to eliminate products which are radically unfit for the intended services. It is only when finer distinctions are involved that serious reversals are encountered. For instance, several of the better abrasion resistance tests will distinguish between first-grade and second-grade treads when the actual service differences in the treads are fairly wide and when the treads have similar degrees of hardness. It is only when close comparisons between treads of dissimilar hardness characteristics are required that serious reversals occur. While such accurate measurement and correlation are extremely desirable and may some day be possible when we have learned to analyze all of the conditions closely enough, it must be admitted that as yet we are somewhat in the position of trying to weigh a dust particle with ordinary counter scales.

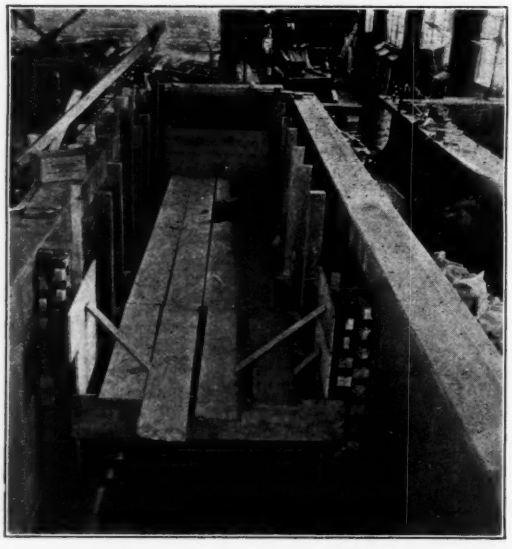
*(To be continued)*

# Rubber Lined Pickling Equipment[1]

## A Difficult Chemical Engineering Problem Has Been Satisfactorily Solved

THE chemical activity and heat generated in the process of pickling sheet steel is exceptionally destructive to the equipment employed. This includes the acid tanks, siphons for removing the exhausted acid liquor, and the sewers for discharge of the waste liquor. Lead, concrete, brick, wood bitumastic, etc., have been employed in the construction of pickling equipment, but are relatively short lived and unsatisfactory in service.

Steel for pickling equipment became available with the development of special rubber compositions and methods for permanently uniting rubber to metal. An outstanding example in this field of rubber engineering is the Vulcalock bond and Triflex rubber.



**Steel Pickling Tank—Rubber Lined and Brick Sheathed**

Vulcalock attachment requires processing the metal surface and special preparation of the rubber stock in its uncured form. The pliable semi-plastic gum is applied to the metal and cured in place. Remarkably powerful adhesion is effected during the curing operation. Similarly the soft rubber base vulcanizes inseparably to hard rubber. Thus any steel tank may be lined, encased with either soft or hard rubber for the protection of the metal from corrosive action.

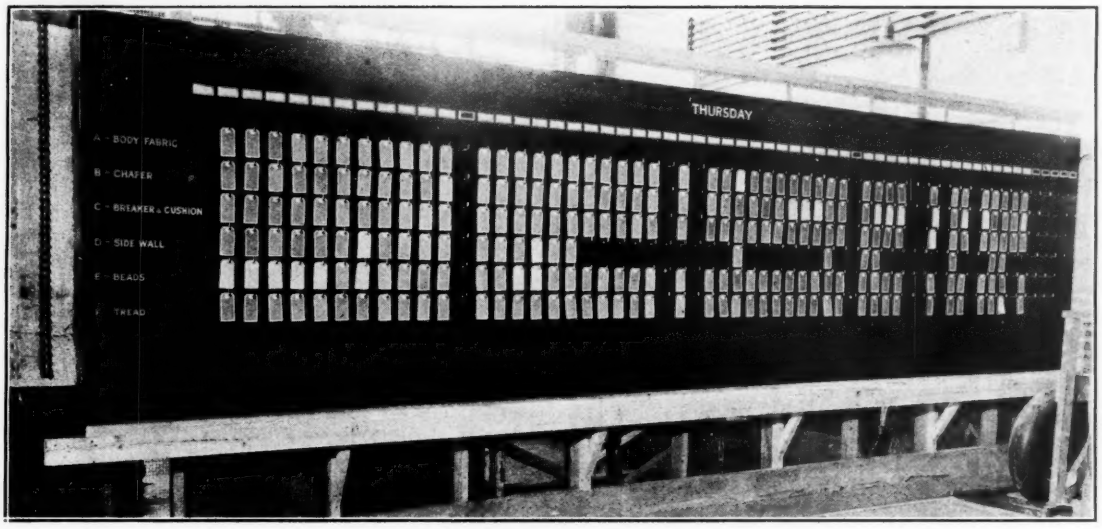
The Triflex joints mentioned are located at intervals across the lining to compensate expansion of its hard rubber component. In the construction of the joint the soft backed hard rubber is terminated at intervals, and its continuation is effected by another overlapping section of the hard and soft combination covering the edge of the first section. The overlapped hard rubber layers are separated by a thick cushion of soft rubber, which serves to relieve the strain of expansion which would otherwise cause breakage of the hard rubber ply.

While the rubber lining affords complete protection to the steel pickling tank against corrosion, it in turn requires protection against damage by handling the sheet steel in and out of the pickling bath. Therefore acid resisting brick sheathing of 2 courses is installed, laid up against the rubber lining in a sulphur base cement known as Vitro-Bond. Rubber expansion joints of Triflex type are inserted in the brick sheathing as well as in the rubber lining.

A rubber lined pickling tank is shown in the illustration, with the brick sheathing partially completed. In the left foreground the location of 2 expansion joints may be seen; they appear in the side wall of the rubber lining.

Two years' service of this lined equipment is declared to have shown no apparent deterioration, which is strongly indicative that a difficult problem in chemical engineering has been thoroughly and satisfactorily solved by the use of a specially prepared and processed rubber.

[1] Abstracted from "Modern Strip Pickling Equipment," by Dr. H. E. Fritz of the B. F. Goodrich Co., Akron, O., in *Iron Age*, Sept. 6, 1934, pp. 36-37.




Material Schedule Control Board

# Production Control

## Stock Planning and Material Control

**J. D. Towne**[1]

IN 2 previous issues[2] the writer covered 2 basic steps in management which contribute largely to manufacturing control: i.e., "Elemental Time Analysis" and "Man Load Control," both of which effect control from the labor standpoint. To assure labor the opportunity to produce up to its maximum, however, it is the responsibility of management to see that equipment is in proper operating condition and that necessary materials are available in the right place and at the right time. To accomplish this system a production control department should be organized to develop stock planning and material control.

The object of a production control department is so to anticipate the requirements of productive materials that their arrival at the building machines or other productive units is so coordinated with these actual requirements as to eliminate all delays caused by waiting for their arrival. In a plant where ample space, equipment, and liners are available, these requirements can be anticipated sufficiently far in advance so that any failure in mechanical equipment or operating efficiency can usually be made up before the tire builders are seriously affected. In many rubber plants, though, owing to limited floor space, liners, and certain mechanical capacities processing operations cannot be scheduled more than 36 to 40 hours ahead of tire building or other productive operations; consequently any slight failure of equipment or other holdup is quite likely to be reflected, to some extent at least, in the building departments.

While this inability to build up stocks of processed material farther ahead of production works a hardship upon these productive operations and makes control a less clerical and routine job, at the same time it enforces a smaller inventory of work in process and, consequently, saves money in this regard.

As a basis for this type of material control, in one rubber manufacturing company specification lists for each kind of material used in tire building have been developed from the regular specification sheets. These lists give the actual amount of every kind of material, for each size and kind of tire, that must be processed and prepared to meet the building schedule. These lists have been in use sufficiently long to prove their accuracy under present conditions. As conditions or specifications change, these lists must likewise be changed to be kept up to date.

Each week, usually Wednesday morning, the tire requirements for the following calendar week are issued by the sales department. From these requirements gum stocks ahead of calenders are checked to guarantee proper milled stocks to start schedule. Raw fabrics are ordered out of stock and dried, and a fabric calender schedule issued so that requirements can be run at least 2 full days ahead of the tire building schedule. These 2 days are maintained throughout the balance of the week owing to limited floor space for storage of processed materials, but allow sufficient time for stock preparation.

As the shop is running, when operating, close to capacity, (6 days a week, 6 hours a shift), each Friday immediately after lunch time a specific schedule is issued showing tire sizes, kinds, and quantities that will be built during the 24 hours of operation starting Monday at 7.00 a.m. From this daily building schedule orders

[1] Consulting engineer, Dayton, O.
[2] India Rubber World, Aug. 1, 1934, pp. 33-34, 36; Sept. 1, pp. 29-31.

are issued by the order clerk, covering the materials to be processed, etc., and sent into the shop that same (Friday) afternoon. This same relation (Friday p.m. to Monday a.m.—Monday p.m. to Wednesday a.m.) is maintained throughout the balance of the week, allowing under present conditions of operation about 36 hours ahead of building requirements for the beginning of processing and stock preparation.

All materials should be processed, prepared, and in stock ready for tire building at 7.00 a.m. each morning that will be required to fill the building schedule for the next 24 hours. This system is the basic goal of this production control, and everything aims toward its accomplishment. While the issuing of orders covering necessary materials is fundamental, an active and accurate follow-up to this end is also imperative.

Accurate copies of all orders issued to processing and stock preparation departments are to be sent at the same time to the order of work clerk, or follow-up man. Briefly, it will be the duty of this man and his assistants to keep in close touch with work going through these processing and stock preparation departments in order to insure the fulfillment of each day's schedule by the 7.00 a.m. deadline. As previously mentioned, with processing operations running so close to actual building requirements certain delays due to mechanical difficulties, human inefficiencies, etc., will be practically unavoidable. In such cases when the normal flow of work is seriously interrupted, the order of work clerk will specify the sequence in which orders will be run, so as to keep following operations working with the least possible amount of lost, or idle, time. This statement means that the order of work clerk at all times will have the authority to specify the order in which work is to be run through the various processing and stock preparation operations. As a result of this policy, it will be necessary for him to report each day to the order clerk the condition of all material orders in the shop, whether overrun or underrun, so that proper adjustments can be made in the orders issued for the following day.

The order of work clerk is the follow-up man to see that all materials ordered each day by the order clerk are available for use in the tire building as required. Consequently, if for any reason it is impossible to secure any of these materials in time to meet the tire schedule, the order of work clerk must inform the foreman of the tire building department as early as possible so that changes may be made without lost time.

The order of work clerk will be responsible for the centralized stockroom and the stock record board. All gum stocks, bands, etc., are stored in this room, ahead of tire building, in racks and shelves provided. The stock record board, through use of hanging tags, affords a visual picture at all times of the stocks on hand in this room as well as their exact locations. While stockkeepers are in immediate charge of this stockroom and will see that tag stubs on the board correspond at all times to the actual stocks on hand, the order of work clerk is the responsible head and must see that the work is carried on satisfactorily. These same stockkeepers will also keep the tread tag stubs pulled at the end of each shift and post stubs on the proper hooks on the tread control board.

To show to every one concerned, at all times, the condition of all materials being processed and prepared for the coming day's building schedule, 2 material schedule control boards are erected in the tire building department. One board shows the conditions of materials required for the tires scheduled for the current day; the other gives the same information in regard to the materials for the following day's schedule. The boards are designed and operated as follows.

Each board, painted black, is 20 feet long and approximately 5 feet high, mounted on the outside of the centralized stockroom, facing the tire building department; one board on each side of the doorway. At the center and the top of each board are hooks upon which is hung the name of the day the ensuing data, regarding tire schedule and materials, are to cover. For example, on Monday afternoon Wednesday's board will be started; on Tuesday afternoon Thursday's board, etc.

Below the heading a horizontal line of 60 brass label holders, spaced in 3½-inch centers, extends across the entire length of the board. Daily, as a board is started for the day-after-tomorrow's schedule, a duplicate of all tire sizes and brands to be built on that schedule will be posted in these brass holders. That is, a ticket will be inserted in a holder representing each size of 4- and 6-ply, black and white sidewalls, first grade tires scheduled for that particular day's operation. In the same way each size of second and third grades as well as truck and bus tires will also be shown, but not necessarily the quantities to be built.

Below this line of schedule tickets 6 parallel lines of single hooks, spaced on 3½-inch centers horizontally and 5-inch centers vertically, are provided. At the extreme left of the board these 6 lines are identified—

| | |
|---|---|
| A—Body Fabric | D—Sidewall |
| B—Chafer | E—Beads |
| C—Breaker and Cushion | F—Tread |

These 6 items control, in practically all cases, the building operation. That is, if these 6 items of material are on hand for certain tires, those tires can be built without delay. If any one of these 6 items of material is missing for a certain tire size, that certain tire size cannot be built.

Each day, as a tire schedule is inserted in the brass holders, tags are hung upon each hook in the 6 parallel lines. These tags are without any printing, but colored red on one side and green on the reverse. At the time the schedule is posted, all tags are hung with the red side out, signifying the material, as represented by the name at the extreme left and for the tire size and brand as shown on the label at the top of the board, is not ready for the schedule of the day shown at the top of the board.

As the order of work clerk and his assistants follow up the orders issued by the order clerk to the processing and stock preparation operations and ascertain that certain materials are ready for the tire building of the schedule on the board, they immediately turn the corresponding tag, or tags, which then shows green, signifying the materials so represented are ready for the tire building. As the time approaches the hour at which the schedule on the board is to start in operation, more and more tags are turned from red to green, until at 7.00 a.m. of the day represented by the board all tags should show green, indicating that all materials required for the tire building schedule for the next 24 hours are completed and on hand.

This board enables (a) the foreman of the tire building department to tell at a glance how possible it will be to complete any item on his schedule: (b) the foremen of the processing and the stock preparation departments can be guided to some degree by this picture of the entire production situation: (c) the production control department is constantly alert to the point at which most effort must be used to avoid delays and holdups in tire building: and (d) the superintendent immediately learns the entire shop situation and what spot requires his personal attention. The condition of material control is constantly visualized for anyone in the organization who has occasion to be concerned.

Besides the red and green tags, as described above,

yellow tags are also available. In case any material is not ready and on hand at 7.00 a.m., but can be positively assured of delivery before it will be actually required at the building operation, a yellow tag is hung on the corresponding hook in place of either the red or green. This conveys to every one concerned the correct information and avoids the possibility of the building foreman changing his schedule because of a red tag, when the material will be available before it is actually needed.

It has been previously mentioned that 2 of these material schedule control boards are used. The second board, an exact duplicate of the first both in design and operation, alternates with the first board in being used for the daily schedule. That is, on Monday afternoon board No. 1 is posted and started on Wednesday's schedule. On Tuesday afternoon board No. 1 is still on Wednesday's schedule, having its tags turned from red to green as material comes through, and board No. 2 is posted and started on Thursday's schedule. Wednesday afternoon board No. 1 has served its purpose, by showing the condition of materials at 7.00 a.m. and through Wednesday morning; then it is released to be stripped and posted for Friday's schedule. In the same manner board No. 2 is changed Thursday afternoon and started on Saturday's schedule, and so on through the complete week.

The production control department is organized on a permanent basis, with one man as the responsible head, accountable to the plant management for the successful operation of the department. This man is in close touch with all phases of the work: issuing of daily tire building schedules; ordering of materials to be processed, and through stock preparation, from both weekly and daily schedules; follow-up of these orders through the processing departments; and finally seeing that materials are ready for production within the established time. He ties in all the work of material control and uses his own judgment as to where his immediate attention is required.

The order clerk issues the orders to the several processing and stock preparation departments, based upon weekly and daily tire building schedules, together with the specification lists. These orders, both weekly and daily, are sent direct to the department heads affected by the orders, and copies sent at the same time to the order of work clerk. The order clerk is responsible to the department head for the proper fulfillment of his duties.

The order of work clerk is responsible for the follow-up of all material orders issued by the order clerk to the several processing and stock preparation departments. He is the responsible head of material control in contacting with the manufacturing departments. He controls the order in which work is processed and prepared, keeping in mind at all times both economy of manufacturing operations, and the order in which materials will be required for tire building purposes. The order of work clerk must report back to the order clerk any variations in actual fulfillments of orders as issued so that corrections, either plus or minus, can be made in quantities ordered for the following day. The order of work clerk is responsible for the proper operation of the centralized stockroom, the stock record board, the tread board, etc., through the stockroom boys, who are under his control. He will also be responsible for the proper operation of the material schedule control boards and for their showing at all times the true condition of materials in reference to the tires scheduled. The manner in which the stockrooms and various boards operate has been outlined.

The order of work clerk will have sufficient assistants to enable him properly to take care of the above duties. The number of these assistants will vary with the operating conditions of the plant, but usually at least 2 will be required; one on days, working with the order of work clerk and doing general follow-up; the other, a full-time man, in charge of the same general material control work during night operation. The night man is entirely responsible to the order of work clerk and receives from him all instructions in regard to his duties. These several assistants and stockroom boys are all working under the direction of the order of work clerk, who in turn is responsible to the department head for the successful discharge of the above duties.

The smoothness and the success with which such plans of material control function in any manufacturing plant depend very largely upon the personnel of the manufacturing organization as well as the group of men who are immediately responsible for the material control department. None of these plans is self-operating, and while, if properly used and followed up, they will supply in easily understood form the information essential to intelligent operation, they will very quickly slip into inaccuracies, and consequent depreciation in value, if not backed up by alert and interested cooperation from the entire executive organization.

# Commercial Applications of Latex Compounds[1]

IN THE manufacture of commercial products from compounded latex, it is necessary to recover the rubber from the latex by one of 5 methods which follow.

Evaporation, which is probably the most common and easiest to effect. The article with the latex on it is passed through a drying chamber at a somewhat elevated temperature or merely given sufficient time to dry out in air.

Coagulation, in which the article is dipped into a dilute acid prior to dipping into the latex, or following the first dip. The ammonia of the latex is relied upon to neutralize the acid used so that it is seldom necessary to wash the acid out. The latex may be extruded in the form of a rod from an orifice into a bath of coagulating solution such as dilute acid producing a thread or ribbon.

Filtration is effective where porous forms may be used. The water or serum is withdrawn from the latex, leaving a coating of the rubber compound. A porous form may be dipped into the latex, leaving a film which is later stripped off. Fabrics, coated with latex, absorb the liquid in and around their fibers, leaving a film on the surface.

Electrodeposition, where the form is hung in compounded latex through which an electric current is passed. The latex particles by their nature are electrically charged and therefore act as a conducting medium. Under suitable electrical conditions the rubber may then be deposited on the anode or positive pole of the bath. A film of definite regular thickness can be built up to produce a suitable article.

Heat coagulation is sometimes used in dipping processes.

Frothing, sometimes an unfavorable property of latex, is useful in the manufacture of sponge and porous ar-

(*Continued on page* 42)

[1] *The Vanderbilt News*, Sept.-Oct., 1934, p. 29.

# Rubber Covered Suction Rolls

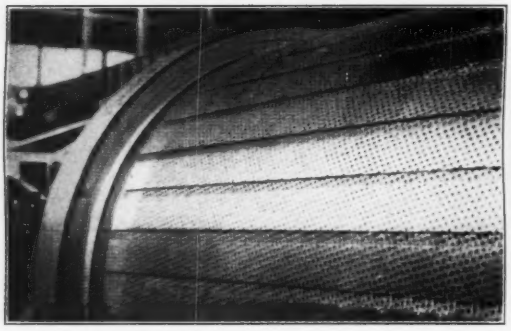


Fig. 1. Dovetail Grooving and Threading of Bronze Shell and Steel End Rings

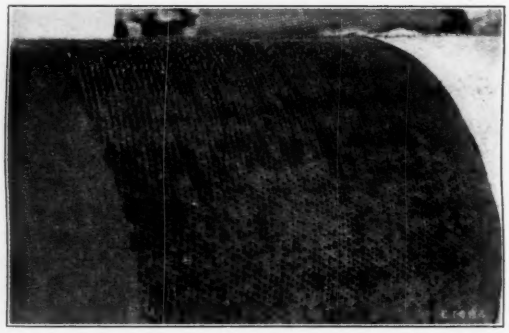


Fig. 2. Roll Partly Unwrapped after Vulcanizing, Showing Projecting Pegs

THE covering of suction press roll shells with rubber is relatively a recent introduction in paper manufacture. The process of anchoring the rubber covering to the perforated bronze shell of such rolls requires special care and preparation of the metal body. The practice, as conducted by a well-known rubber company,[1] is here abstracted from a recent publication.[2]

Fig. 3. Surface of Finished Roll

The anchoring of the rubber to the bronze shell requires special care and preparation of the metal body as rubber does not bind to bronze so readily as to cast iron or steel. Dovetail grooves are therefore cut longitudinally across the surface of the shell and around the ends and the inner face of the external end rings. It will be seen from the illustration that these dovetails form a positive means of holding the monolithic mass of the covering after it has cured, as they are of ample dimensions to resist any chance movement of the rubber relative to the bronze. V-threads are finally cut across the entire face, a process similar to that used on iron or steel shells, for final assurance of security.

The rubber is mixed and calendered in the same manner as for a standard press roll and is applied by winding on to the body in sheets until the covering is built up to the required thickness and wrapped with many layers of fabric to support it during vulcanization.

The first method used in the manufacture of rubber covered suction press rolls was to drill the shell and apply a solid rubber covering, subsequently drilling through the rubber from the outside. This method presents several mechanical difficulties; besides it is not applicable to the covering of existing suction-roll shells, as it is impossible to register the holes from the outside after they have been drilled unless special precautions are taken in drilling the bronze shell.

The process of molding the holes in the rubber is a special engineering development. Metal pins of the proper size are inserted in the shell holes from the inside and driven through the rubber covering and wrapping. The wrapping serves to hold the rubber tightly to the shell, and the displacement caused by the insertion of the nails compacts the rubber in its confined space. The process thus becomes more nearly a molding operation than the ordinary roll covering.

[1] American Wringer Co., Woonsocket, R. I.
[2] *The Dominion Engineer*, published by Dominion Engineering Co., Ltd., Montreal, P. Q., Canada.

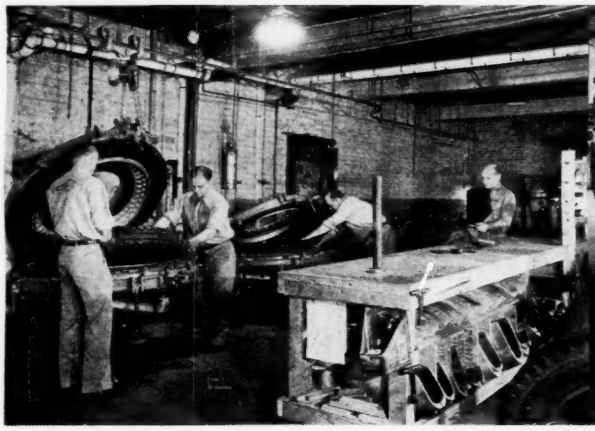
## Sound Absorption by Rubber

RUBBER is not classed among the materials used for the interior finish of auditorium walls and ceilings to reduce reverberation and improve the acoustic quality of the room by sound absorption. It is used only on floors for deadening noise caused by walking and moving furniture.

While the National Bureau of Standards has as yet made no investigation of different materials for deadening the sound of footsteps or moving furniture, it has actually measured the sound absorption of rubber both in manufactured form and in the form of sheets of raw plantation rubber for sound absorption when sound waves impinge upon it, and the Bureau found that rubber has only 2 or 3% absorption. Sound absorption in this sense is not a matter of softness and resiliency, but of porosity. The sound waves seemed to be reflected from the resilient rubber just as a billiard ball would be with a comparatively small loss of energy. For the deadening of footsteps or the moving of furniture the question is entirely different.

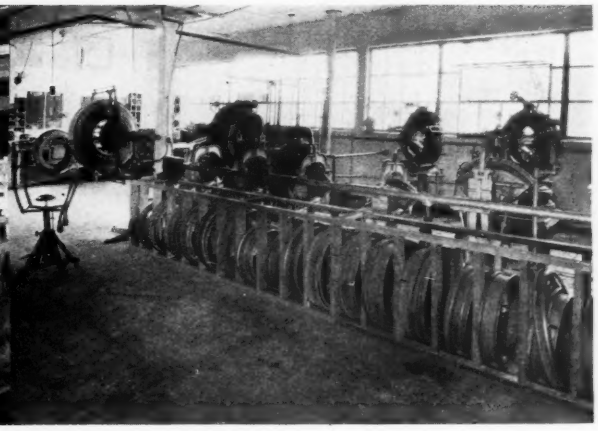
# Retreading Inspection

D. C. McRoberts



*Commercial Tire & Supply Co.*

**Safety Vulcanizer Shop**



*McClaren Tire Co.*

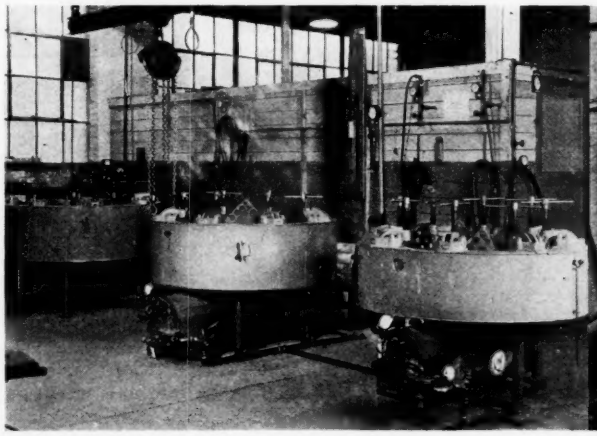
**Lodi Shop Equipment**

THIS article is addressed to those retreaders who, because of their integrity and high ideals, deserve the cooperation of all possible agencies to rid the retreading business of disintegrating influences and to raise the standards of the art by disseminating correct and helpful information. It presumes the operator to have his source of tires already established and that rejections will be the responsibility of that source, whether customer, used tire dealer, or both.

The service quality of a tire, either new or used, depends on the degree of perfection of its fabric structure: namely, the carcass. High-order worth-while retreading has proper application only to tires with good serviceable carcasses. It is true, unfortunately, that worn-out carcasses can be retreaded to have excellent appearance; to this fact "gyps" owe their existence; to them the public owes its lack of full confidence in the economy that proper retreading merits.

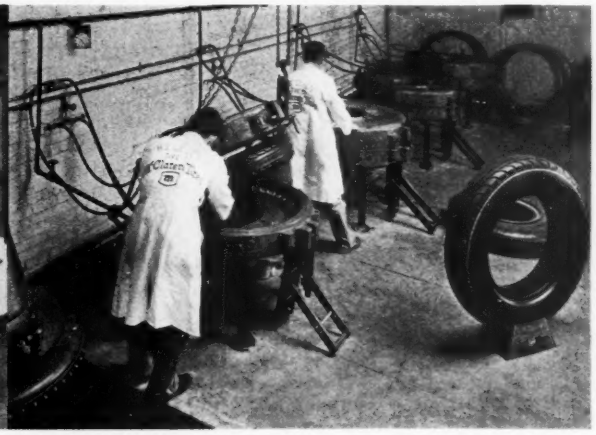
Inspection of the old tire is, therefore, the only means of determining if its carcass is, or can be put, in good enough condition to wear out another tread, or whether it is in a deteriorated condition, thus fitting it only for the scrap pile. Inspection is logically the first operation in proper retreading, nor can its importance be overemphasized since satisfaction of the potential user and the reputation of the retreader are both at stake. It should be constantly in mind that good workmanship and materials, applied during succeeding operations, will not correct errors of inspectional observation and judgment.

Inspection should be conducted in steps that eliminate ineligible tires with least possible labor expense. Third and lower line tires should be rejected on sight. Some retreaders will not consider second line tires, but this policy seems a bit overcautious. It is well to keep in mind that lower line tires differ in service expectancy and price—which distinguish their class—principally because



*James C. Heintz & Co.*

**Truck Tire Retreaders**



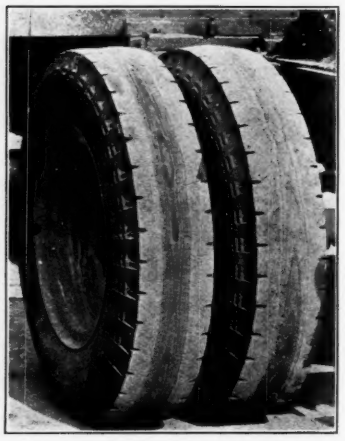
*H. S. Gillen Tire Co.*

**Flynn & Collins Retreaders**

of shorter staple cotton, less expensive cord constructions, and stepped-down gum stock quality. Such carcasses can hardly be expected to wear out another tread even though they appear to be in fairly good condition at the time of inspection.

*Chas. E. Miller Corp.*

**Miller Repair School**



**Worn through Tread and Several Plies**

Examination of casing exterior will permit elimination of those showing large blow-out ruptures regardless of shape or location; badly worn or disrupted conditions of fabric or wires in bead region; and treads worn through breaker, cushion, and 2 or more carcass plies either in long spots or completely around the circumference.

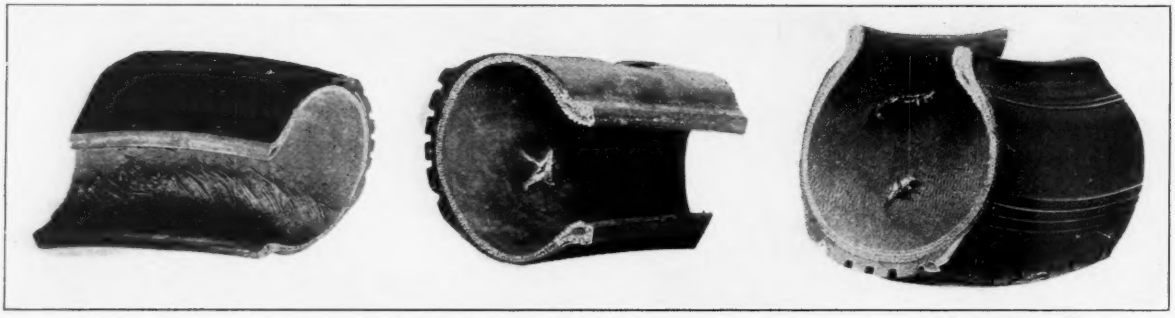
More exacting scrutiny directed to the inside of the casing, and involving the aid of spreading equipment,[1] constitutes the third and most time-consuming step of inspection. This step places a premium on good judgment, power of observation, and experience. At this stage a final decision must be reached as to whether the used casing in question is suitable to retread directly; or only injured and in need of carcass repair before retreading; or deteriorated and worn-out, thus qualifying it for destruction only. Not only the repute of the individual retreader and the retreading business, but the vital matter of safeguarding human life hangs in the balance of the inspector's judgment.

**Deteriorated Fabric and Gum Stocks**

Spreading the beads of the tire is necessary, first, to make the casing inside accessible for proper observation, and, second, to distort the component parts to exaggerate existing defects, some of which would otherwise remain hidden.

Casing insides thus revealing large blow-out ruptures; fabric loosely frayed or broken, usually in lines circumferentially imposed along flexing lines or above beads; and/or any bulging evidence of ply separation denote deterioration or abusive use and should be eliminated. Relinders will hide, but not cure these vital weaknesses; consequently they should not be imposed on the customer in a retreaded tire.

Differentiation should be made between the foregoing types and localized injuries in otherwise good casings, which result from accident. Fabric cuts caused by glass or metal objects, well defined breaks due to violent impacts against curbs, stones, or road irregularities, short rim cuts occasioned by misshapen rim flanges, and thread breaks brought about by some foreign object between tube and casing are typical examples of localized injuries. They are usually smaller, less frayed, and the surrounding carcass of firmer, stronger appearance than is true with the worn-out type. In passenger sizes such injuries should without exception be given sectional repairs, then retreaded, but with truck and bus balloon only if the injury is very small.



**Frayed Fabric Caused by Running Flat** **Localized Break Caused by Impact** **Accidental Flattening of Sidewall against Rim Edge**

Casings that have been stored out-of-doors or that have cuts or treads worn to the fabric are invariably more or less saturated with moisture even though they do not feel wet to the hand. These, without exception, should be dried thoroughly in a heated room before proceeding with retreading operations. A very high percentage of the troublesome "blows" are due directly to unremoved carcass moisture. Prevalence of this difficulty in wet seasons and its miraculous reduction, if not total disappearance, in dry seasons are conditions attending the shop without a dry room, or one insufficiently used. Indeed the forced drying of all casings before retreading constitutes insurance of most valuable returns.

[1] See India Rubber World, Oct. 1, 1934, pp. 35-37, 41.

# Rubber Paints

Joseph Rossman, Ph.D.

THE following abstracts of United States patents continue the interesting and informative article on rubber paints published in our October issue.

109. Stine and Booge, 1,700,779, Feb. 5, 1929. A coating composition includes a liquid containing an incompletely vulcanized rubber and a drier and being substantially free from a drying oil, the proportion of drier and rubber being such that the rubber in a surface layer of the liquid, when exposed to the air at between 80 and 500° F., will become cured.

110. Sheppard and Schmitt, 1,701,129, Feb. 5, 1929. The process of making a quick drying, sprayable, liquid coating composition comprises heating comminuted hard rubber in an aqueous alkaline solution until its susceptibility to flux is increased; drying the treated hard rubber; incorporating it into a molten flux comprising 28 parts of resin to 12 parts of a drying oil; heating it between 200° and 250° C. until homogeneous fusion takes place; and dissolving the mass thus produced in a solvent containing a liquid hydrocarbon of the benzene series.

111. Bradley and Gibbons, 1,703,920, Mar. 5, 1929. A coating composition comprises chlorinated vulcanized rubber 100 parts, a pigment in the proportion of 5 to 250 parts, and benzol in the proportion of 3 to 5 times the weight of the solids.

112. Butler, 1,710,470, Apr. 23, 1929. Liquefied rubber composition is made by dissolving crude rubber in benzol in the proportions of 3 to 5 ounces of crude rubber to 2 pints of benzol; adding carbon tetrachloride to the solution of rubber in the proportions of 4 to 5 pints of carbon tetrachloride to 2 pints of the benzol solvent; and boiling the mixture at a temperature of between 100° and 120° C.; and subjecting the vapors to the action of a reflux condenser.

113. Stine and Coolidge, 1,721,930, July 23, 1929. This invention relates to a paint or varnish made from deaggregated rubber. Various methods for deaggregating rubber may be employed, and the following examples are given.

Example 1. Rubber suitably plasticized by milling is dissolved in benzol, turpentine, or certain petroleum distillates and drier incorporated therein to give a substantially homogeneous solution which, on aging in the presence of air or on suitable agitation, will become deaggregated. As an example, 2 pounds of rubber are plasticized on a rubber mill for 20 minutes and then dissolved in 18 pounds of benzine, with the aid of mechanical agitation. To this solution is added 0.01-pound of cobalt linoleate dissolved in 0.04-pound of turpentine, and the whole mixture vigorously agitated in contact with the air for approximately 60 hours. The agitation should be such that air is churned into the solution. At the end of this period it will be found that the viscosity of the solution has dropped to a value of about 40 seconds (by the Scott viscosimeter) as compared to the initial viscosity of about 2,500 seconds.

Example 2. Likewise, rubber suitably plasticized by milling may be dissolved in turpentine or compounds chemically similar which have been oxidized through them, and on proper aging will become deaggregated. The following example illustrates the process. Two pounds of rubber previously milled for 20 minutes are dissolved in 18 pounds of oxidized turpentine prepared by blowing oxygen through turpentine for 24 hours. The above rubber solution is then vigorously agitated in contact with the air for 120 hours, when it is found that the viscosity has dropped to about 80 seconds (Scott viscosimeter) as compared to the initial viscosity of about 2,700 seconds.

Example 3. Certain chemical compounds, such as acetic acid or its substitution products formed by chlorination, benzoic and formic acids, etc., also can deaggregate rubber solutions. The following example illustrates this procedure. Two pounds of rubber milled for 20 minutes are dissolved in 18 pounds of benzole. To this solution is added 0.02-pound of trichloracetic acid, and the mixture mechanically agitated for about 90 hours, when the viscosity will have dropped to a value of about 55 seconds (Scott viscosimeter) as compared to an initial viscosity of about 2,400 seconds.

Regardless of the method used to effect deaggregation, the deaggregated rubber is incorporated with a drier, with or without oils, to give coating compositions which, when exposed to the atmosphere or heated in the form of thin films, will give protective coatings of great durability, hardness, and flexibility. Moreover pigments may be incorporated in such compositions to give color varnishes or enamels having the same desirable properties. The following formula in which the proportions are indicated by weight illustrates one type of varnish liquid containing deaggregated rubber: deaggregated rubber (as dry rubber), 108 parts; bodied Perilla oil, 148 parts; cobalt linoleate, 2.1 parts; benzine, 452 parts. Pigments may, of course, be incorporated in this formula to give enamels or color varnishes. Besides the oil may be omitted to give a clear rubber varnish which will yield a very durable, protective coating on air drying or heating.

The type of varnish liquid, containing both crude (aggregated) and deaggregated rubber, is illustrated by the following formula in which the proportions are indicated by weight: bodied Perilla oil, 168 parts; crude rubber (as dry rubber), 19.2 parts; deaggregated rubber (as dry rubber), 47.7 parts; black pigment, 30 parts; cobalt linoleate, 1.2 parts; benzine, 365 parts.

114. Stine, 1,721,931, July 23, 1929. The following formula illustrates a coating composition containing a curing agent in addition to a drier; proportions are given in parts by weight: deaggregated rubber, 108 parts; bodied Perilla oil, 148 parts; dinitrobenzine, 452 parts; cobalt lineoleate, 2.2 parts.

115. Stine and Coolidge, 1,723,632, Aug. 6, 1929. This invention is based on the discovery that deaggregated rubber may be incorporated with a cellulose derivative to give coating compositions which, when exposed to the atmosphere or heated in the form of thin films, will give protective coatings of great durability, hardness, and flexibility. Moreover pigments may be incorporated in such compositions to give color varnishes or enamels having the same desirable properties.

One of the advantages of using deaggregated rubber is the ease with which the resulting composition can be applied to various surfaces. Solutions of such rubber can be satisfactorily sprayed, using the standard types of spray guns. Accordingly, products containing deaggregated rubber can, in general, be successfully sprayed in practical use. This feature is distinctly novel since rubber solutions of ordinary viscosity (in the case of a 10% solution, around 2,500 seconds, Scott viscosimeter) do not spray satisfactorily, but tend to "string," when atomized, and, as well, give unsatisfactory sprayed films, showing "pebbling" or "sags."

The chief advantage secured in using deaggregated rubber is due to the fact that solutions of such rubber appear to be more compatible with cellulose derivatives. The following formulæ are given: (A) rubber, 20 parts; nitrocellulose, 80 parts; linseed oil, 200 parts; lead linoleate, 1.5 parts; butyl acetate, 600 parts. (B) rubber, 75 parts; ethyl cellulose, 25 parts; Perilla oil, 70 parts; cobalt linoleate, 1.2 parts; dibutyl phthalate, 4 parts; lithopone, 120 parts; turpentine, 100 parts; benzene, 200 parts; butyl acetate, 100 parts; ethyl acetate, 100 parts. (C) rubber, 30 parts; nitrocellulose, 70 parts; linseed oil, 320 parts; wood oil, 80 parts; cobalt linoleate, 2.5 parts; Prussian blue, 130 parts; butyl acetate, 350 parts; butyl alcohol, 50 parts; toluol, 100 parts. (D) rubber, 50 parts; cellulose acetate, 50 parts; cobalt linoleate, 0.5-part; tricresyl phosphate, 12 parts; butyl acetate, 300 parts; ethyl acetate, 100 parts; ethyl alcohol, 50 parts; benzyl chloride, 50 parts. (E) rubber, 40 parts; cellulose ether (ethyl), 30 parts; linseed oil, 100 parts; cobalt linoleate, 1 part; zinc oxide, 60 parts; benzene, 400 parts.

The rubber may be either normal or deaggregated. The cellulose may be present as any cellulose derivative as nitrocellulose, cellulose acetate, or the ethers of cellulose. The oil may be animal, vegetable, or mineral. A coating composition such as that of (E), when spread out in a thin film and air dried or heated at 130° F. for 4 hours, gives a hard, elastic, waterproof film.

In regard to variation of temperature-time conditions of drying it may be said that for the specific example (E) the approximate limits are: 8 hours at 80° F. to 1 hour at 200° F. If, however, the amount of oil is reduced and rubber-cellulose derivative ratio changed to give an increased amount of cellulose derivative to rubber, more rapid drying can be obtained. For example, when the following ratios are used, rubber, 20 parts; cellulose derivative, 80 parts; oil, 40 parts, drying occurs within the approximate limits of 3 hours at 80° F. to ½ hour at 150° F.

116. Davey, 1,726,473, Aug. 27, 1929. A heat-hardening japan comprises an emulsion in water of an asphalt, a vegetable oil, rubber latex, and an emulsifying agent.

117. Hopkinson and Teague, 1,736,404, Nov. 19, 1929. Cold water paint in general consists of a suspension of certain mineral pigments in water, for example, whiting and calcium sulphate, together with glue or casein as a binder. In addition certain hardening agents such as alum may be added. The paint, therefore, in reality consists of a type of whitewash which, however, is an improvement on the ordinary whitewash since the glue or casein is present as a binder and makes the coating adherent and coherent. But it is not waterproof and surfaces painted with cold-water paint are easily spotted or entirely defaced by the action of water.

It has been found, however, that this defect is very greatly lessened by adding rubber latex to mixtures of the type above described. Glue still preserves its valuable properties as a binder, but the whole mass is rendered more waterproof by the presence of the rubber in the latex. On the other hand the paint is still a water suspension and at the same time gives a relatively waterproof coating without using an expensive and inflammable organic vehicle. The vehicles ordinarily employed in connection with oil paints are substantially waterproof and not defaced by the action of water. Such vehicles are turpentine, linseed oil, etc. These paints, of course, are relatively expensive.

As an example of a cold-water paint employing latex, the following composition is preferred: gilder's whiting, 82 parts by weight; mineral flour, 10 parts by weight; glue, 3 parts by weight; latex enough to make dry rubber, 5 parts by weight; water, 33 parts by weight. The gilder's whiting and mineral flour in the above formula serve particularly to modify the plasticity of the mass, but also vary the viscosity, the glue serving to increase the cohesiveness and adhesiveness of the resulting paint film. In mixing up this composition first glue is dissolved in water, the whiting and the mineral flour are mixed together and added to the water, and the latex is incorporated last to prevent its coagulation. The above example produces a white cold-water paint. Various other colors such as ultramarine blue, Calcutta red, excello green, and Vulcan yellow No. 1 may be employed with satisfactory results.

A hardening effect may be secured by adding to the composition given vulcanizing mixtures functioning at ordinary temperatures such as oxy normal butyl thiocarbonic acid disulphide and zinc butyl xanthogenate and dibenzyl amine with sulphur and zinc oxide. The following is an example of a paint having properties more closely approaching the oil paints and containing a higher percentage of latex: gilder's whiting, 5 parts by weight; mineral flour, 5 parts by weight; Silurian shale, 5 parts by weight; glue, 10 parts by weight; latex sufficient to give dry rubber, 25 parts by weight; water sufficient to make a fluid having approximately the consistency of a thin cream.

In the above formula the Silurian shale serves with the mineral flour to modify the plasticity and the viscosity in the resulting mass. It also affects the cohesiveness thereof. The glue modifies plasticity, viscosity, cohesiveness, and adhesiveness.

In combining the ingredients of the composition the Silurian shale is soaked in water and in the form of a 5% suspension is added to a water solution of the glue containing gilder's whiting and mineral flour. The latex is added last. This material may be vulcanized as desired, as by using the vulcanizing agents mentioned in connection with the preceding example.

118. Healy, 1,744,469, Jan. 21, 1930. A paint for use in electroplating work comprises a mixture of uncured rubber, finely divided asbestos and glue, in approximately equal proportions, and a rubber solvent.

*(To be concluded)*

## Questionnaire on Tennis Shoe Stocks

The Rubber Section of the Department of Commerce, Washington, D. C., has forwarded questionnaire forms to 90,000 shoe dealers in the United States, which relate to tennis shoe stocks in the dealers' possession on November 1, 1934. From these forms a consolidated report of stock is compiled to aid manufacturers in stabilizing production and employment during next year. The Department of Commerce is requesting through all possible agencies that shoe dealers aid this activity by returning the questionnaires with proper information.

# Making Footwear

## Teamwork Apparatus for Mass Production of Rubber Shoes

THE modern method of assembling the parts of an article complete on a moving conveyer has been adapted to the construction of rubber shoes. In the case of volume production of shoes of the same style this development greatly increases production per worker and economizes space and stock handling expense when compared with the conventional method whereby individual operatives assemble all the pieces to make a complete shoe. By that method each shoemaker requires liberal table space for handling stock, lasts, and goods. Besides, the services of attendants are also necessary to fetch and carry supplies and deliver the completed shoes. Figures 1 and 2 represent in plan and cross-section, respectively, a patented conveyer system[1] for making rubber shoes in the plant of a leading American rubber goods manufacturer.

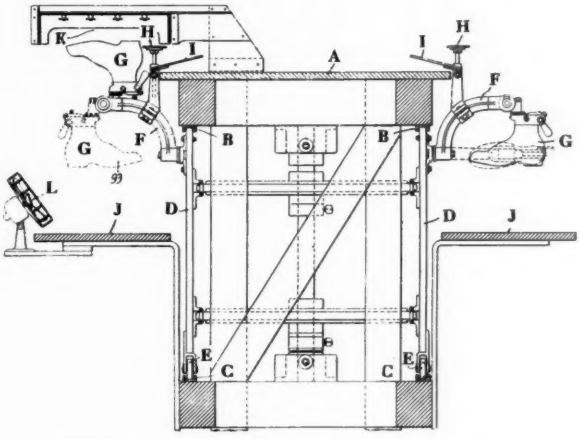



Fig. 1. Vertical Section of Shoe Assembly Apparatus

The general support of the conveyer, shown in vertical section, Figure 1, consists of a high table *A*, to the upper and lower stringers of which are attached channel irons, *B,B* and *C,C* serving as rails to guide the cross-connected standards *D,D* mounted on wheels *E,E*. The standards *D,D*, spaced apart at convenient intervals, are connected top and bottom by sprocket chains and form a motorized system that is made to travel around the table *A* as indicated in Figure 2. Each standard bears a gooseneck bracket *F* for holding a last *G* adjustable in a variety of convenient working positions. Also there is bracketed to gooseneck *F* small shelves *H,H* and *I,I*, shown in Figure 1. Ample work benches *J,J* are located on each side of the central supporting structure. A canopy *K* appears over a short section near the end of one of the benches. Its purpose is to circulate the air from the electric fan *L* rapidly to dry the cement on a passing partially finished shoe.

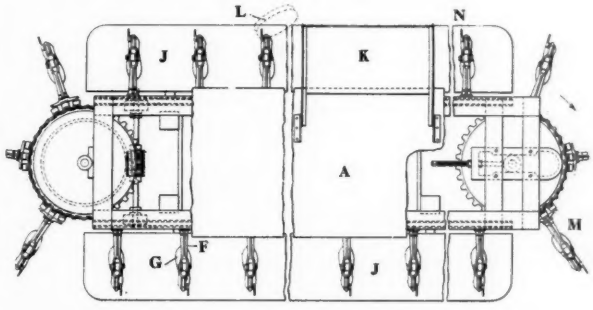



Fig. 2. Plan of Shoe Assembly Apparatus

The general operation of the mechanism is as follows. Assuming the endless conveyer to be moving in the direction of the arrow in Figure 2, the first operator will be positioned at *M* and the last operator at *N*. The other operators will be positioned at a distance apart from each other preferably equal to twice the distance between the centers of adjacent jacks. The sequence of operations in the manufacture of a typical rubber shoe comprising the parts shown in Figure 3 follows. Assuming the conveyer to be traveling in the direction of the arrow, Operator No. 1, at *M*, selects a last, pulls a lining, Figure 3, a, over the last and places it on a jack on the conveyer where it is gripped with the toe and the sole at an angle of preferably 45°. The operator next strips the piece of rag junior, Figure 3, b, from a board and places it on the table which is shown in Figure 1 at *I*.

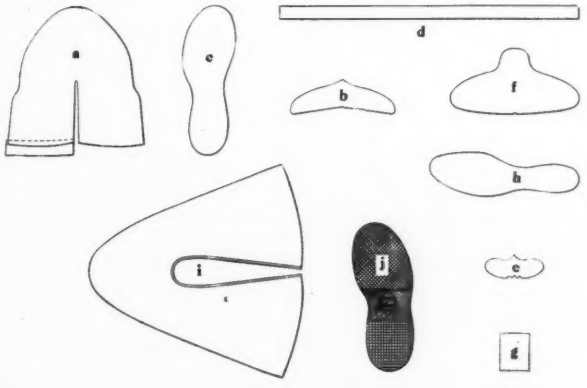



Fig. 3. Parts of a Rubber Shoe

Operator No. 2 places an insole, Figure 3, c, on the last and pulls over the toe of the lining around as far as the shank of the last and sticks the edges of the lining to the insole.

Operator No. 3 pulls over the lining at the heel portion of the last and rolls down the lining all around, sticking the edge of it to the insole.

Operator No. 4 gages the shoe with a marking gage and makes a line on the lining at the heel and on the vamp portion of the lining;

[1] United States Patent No. 1,925,899, Sept. 5, 1933.

these 2 lines are to guide a subsequent operator in placing stock parts on the lining in the process of manufacture of the shoe.

Having gaged the shoe, Operator No. 4 also strips gum piping, Figure 3, d, from a book and places it on the shoe so that it can be carried by the conveyer to Operator No. 5.

The latter applies the piping as follows. She removes the piping from the shoe where it has been placed by Operator No. 4, places one end of it at the breast of the heel, and sticks it to the lining adjacent to the heel portion of the last and around the shoe to the toe. She then carries the piping around the toe along the edge of the lining at the breast of the heel on the opposite side of the last, and then tears off the surplus stock of the piping.

The shoe then passes to Operator No. 6 who attaches the toe tip, Figure 3, e, which is a rubberized fabric, to the toe portion of the shoe adjacent the sole. She next takes the rag junior from the table and places it around the heel portion, with the lower edge projecting slightly beyond the bottom of the heel.

The shoe then passes to Operator No. 7 who attaches the heel piece, Figure 3, f, which is also a rubberized fabric, by first putting the top edge of the heel piece against the line previously made by Operator No. 4 and wiping the heel piece around the heel portion of the shoe and over the rag junior.

The shoe then passes to Operator No. 8 who applies the shank stay, Figure 3, g, of rubberized fabric, and rolls the shank stay and also the piping and heel piece.

Operator No. 9 attaches the filler, Figure 3, h, and rolls it to the sole portion of the shoe. The filler is a rubberized fabric.

Operator No. 10 takes the rubber compound upper, Figure 3, i, from a book, applies it to the last, pulling over the toe, which is held to the lining by the adhesion of the rubber compound.

Operator No. 11 pulls the upper around one side and cuts the back seam, being careful to set the upper edge of the upper at the back of the shoe on the gage mark of the heel portion of the last, and this operator cuts the back seam.

Operator No. 12 pulls the upper around the other side of the shoe and gages the seam, lapping it over the back seam which had been previously cut and positioned by Operator No. 11.

Operator No. 13 wipes the shoe with a damp cloth and rolls the shoe with a rubber roller. This action smooths the upper down on to the parts previously applied and also marks lines on the upper as may be required to give it the proper appearance and design.

Operator No. 14 performs the same operation as No. 13, that is, Operator No. 13 and No. 14 each take every other shoe, since it was found that it takes too much time for one operator to perform this whole operation.

Operator No. 15 skives the shoe and removes the scrap, that is, cuts off the excess amount of the upper which has been folded over the edge of the last and removes the scrap.

Operator No. 16 "stitches" the back seam by means of a knurled disk.

Operator No. 17 removes the shoe from the jack, cements the bottom of the shoe, and places it on the table, Figure 1, *H*. She then cements the outsole, Figure 3, j, and places it on the table, Figure 1, *I*. Now the bottom of the shoe is covered with an adhesive such as rubber cement, and the inner face of the outsole is also covered with a cement, and the endless conveyer carries both the cemented shoe and the cemented outsole along beneath the drier, Figure 1, *K*, which vaporizes the solvent so that when the shoe comes out through the other end of the drier, the cement has been dried just sufficiently to make it somewhat tacky.

Operator No. 18 takes the shoe and the outsole from the conveyer, places the shoe on a convenient support, such as a table, and rolls and "stitches" the outsole into place on the shoe, thus completing the shoe. This last operation is performed by one operator on every other shoe the same as in the case of Operators 13 and 14, so that Operator No. 19 takes the next shoe and performs the same operation as Operator 18.

The type of shoe to which the foregoing operation particularly applies, in all its details, is one type of men's shoes, but if the shoe were to be a woman's, youth's, tennis, or other styles of shoes, the number of operations and the particular way of applying them might vary, but the general operation would be the same.

## Para-Graphs

COMBINING FINE FABRICS. In the manufacture of shoes necessary stiffness is secured by a backing of cotton drill. This operation, known as combining, is effected by the use of rubber cement or balata tissue as the adhesives. The use of rubber solvent cement involves fire hazard due to the liability of electrical ignition of the flammable volatile solvent as the fabric is spread with the cement. This risk is completely eliminated by the use of compounded latex in place of rubber solvent cement. A heavier and more permanent layer of rubber is applied, which will better withstand the deterioration of the ultraviolet rays that penetrate the fabric.

AIR-DRIED SHEET RUBBER. This is a comparatively new product that owes its introduction to the difficulty of obtaining firewood for smoke drying. Air-dried sheet rubber is said to be of attractive appearance, possessing the necessary properties that make it a fitting substitute for smoked sheets, which it is intended to replace.

SURGEONS' GLOVES, the surface of which has been subjected to a "frosting" process, are said to provide a firmer grip on instruments, sutures, and ligaments than rubber gloves of the ordinary type.

## Commercial Applications

(*Continued from page* 35)

ticles, where the compounded latex is beaten mechanically to incorporate air, allowed to gel in the frothed condition, and dried by heating with subsequent cure in steam.

The advantages of latex in manufacture of rubber goods are (1) varied methods of obtaining the rubber, (2) greater concentration and consequently more rubber obtained than in cements, (3) the product is grainless, (4) no fire hazard, and (5) lower cost.

Some of the uses of latex in commercial products are:

Wire Insulation. Flexible cords, multiconductor cables.

Proofing. Raincoats, impregnated papers, imitation leather.

Sealing Compounds and Adhesives.

Fabric Impregnation. Tire cords, rug backing, plush backing, fiber backing, shoe parts, brake lining.

Rubber Films. Inner tubes, latex cements—shoe manufacture and repair, sheetings, balloons, nipples, gloves, electroplating tank parts.

Frothed Latex. Sponge, sponged hard rubber.

Hard Rubber. Grinding wheels, battery insulators.

# Annals of Rubber[1]

## Chronological Record of the Important Events in the History of Rubber

**1826.** HANCOCK (Thomas) enters, during February, into a working agreement with Macintosh & Co. concerning their respective patents. A new factory was built at Manchester to manufacture waterproof clothing, and the latter soon began to be made there upon a very extensive scale, since it was found that the tailors would not or could not make up garments in a suitable manner out of the prepared cloth. It was at this factory that Messrs. Hancock & Macintosh made for Captain John Franklin (knighted in 1827) many life preservers, boat coverings, and other waterproof articles used by him during one of his Arctic explorations.

**1826.** HANCOCK (Thomas) manufactures, in May, caoutchouc gas bags for experimental purposes, and, later, at the suggestion of Lieutenant Drummond, they were used in the Trigonometrical Survey with the oxy-hydrogen jets on balls of lime. Speaking of these bags in his subsequent book, Mr. Hancock says that they were "of very strong materials, not only to enable them to sustain the internal pressure of the gas, but also the rough usage they were likely to be exposed to in such service. The air-proof lining was of thin cut sheet rubber, and the exterior of fustian. I had the curiosity at the time to make a bag of this material, which I filled with water and sealed hermetically. I did this for the purpose of discovering whether rubber is or is not absolutely impervious to water. I suspected it was not. The bag is now before me, and I will copy from the record written upon it of its original weight when filled and the periodical decrease of the water contained:

| | LBS. | OZ. | DR. |
|---|---|---|---|
| October 21, 1826 | 1 | 1 | 4 |
| October 25, 1827 | 1 | 1 | 2 |
| October 2, 1835 | 1 | 0 | 0 |
| November, 1844 | 0 | 14 | 12 |
| October, 1849 | 0 | 13 | 4 |
| February, 1851 | 0 | 7 | 8 |
| May, 1854 | 0 | 3 | 14 |

"I have just now, 1856, cut it open; it is quite dry, and weighs 3 ounces 12 drachms, proving that rubber is not absolutely impermeable to water, but admits of a slow and gradual absorption of moisture through its substance; and in this case the whole of the contents of the bag escaped, or rather more than 12 ounces, in the long course of 25 years!"

**1827.** The first known india rubber hose is manufactured by C. Macintosh & Co., at Manchester, and is alluded to by William Baddeley, Jr., in *The Mechanics' Magazine* as having been successfully employed during the large conflagration at Fresh Wharf, in London.

**1828.** HOWE (John J.) obtains a United States patent for a composition of matter to be used as a flexible waterproof and airproof solution, paint, or varnish.

**1828.** HANCOCK (Thomas) enters into a working arrangement with Rattier & Guibal to manufacture abroad whatever may be deemed necessary, and takes over with him to France, Christopher Nickells and Edward Woodcock, Jr., as well as all needed machinery products and workmen, for developing the new industry.

**1828.** COMSTOCK, a physician of Hartford, Conn., makes known a process for dissolving caoutchouc in turpentine to make it plastic and adapt it to being spread upon cloth.

**1829.** HOWE (John J.), of the City of New York, is granted another United States patent for "the combination of india rubber with any of the resins that are soluble in oil of turpentine, or other volatile oil, by means of such of said oils as are known to be capable of dissolving india rubber and the respective resins made use of, so as to form either a paint, varnish or cement that will render porous bodies impermeable by either water or air; and the application of said invention in the improvement in the arts of painting, varnishing and cementing."

**1830.** DAVIS (Charles) describes in the Franklin *Journal*, Vol. V., page 123, the process for combining india rubber with stockinet, as well as a description of goods and the method of making them.

**1830.** HANCOCK (Thomas) sends an agent to Brazil for the purpose of instructing the natives as to the best mode of collecting and preserving the caoutchouc juice.

**1830.** HANCOCK (Thomas) takes out his sixth English patent, on August 5, for the application of the pure liquid caoutchouc, as taken from the trees, to the manufacture of "certain articles of dress or wearing apparel, fancy ornaments and figures." The claim embraced the combination of the "liquid caoutchouc with fibrous and other matters . . . and the application of the coloured composition or varnish to the various purposes" described. The combination was given as 10 pounds liquid caoutchouc, 10 ounces whiting, 10 ounces Oxford ocher, and 10 ounces hair, wool, cotton, or other similar fibrous substance; the coloring matter being lamp black, chrome yellow, blue verditer, or Venetian red.

**1831.** RICHARDS (George H.), of Washington, D. C., receives, April 11, United States patent "for a mode of rendering a variety of articles waterproof by means of fluid caoutchouc, and of otherwise using that substance," as printed page 131, Vol. VIII., of the Franklin *Journal*.

**1831.** Some Vienna manufacturers introduce compound cotton and worsted threads having a center of caoutchouc which novelty is shortly after introduced in England and in France. Both the Leicester and the Nottingham workmen soon improve upon the Austrian method, and make gloves with caoutchouc knitted at the wrist, as well as stockings having caoutchouc attached at the top to serve in lieu of garters.

**1832.** LUDERSDORF, of Berlin, finds that when caoutchouc is mixed with sulphur, it loses its adhesiveness.

**1832.** WEBSTER (Wait), of New York, receives, May 19, a United States patent for attaching soles to gum elastic boots and shoes.

**1832.** DUMESTE (Julien Frédéric Maillard) is given, on December 7, an English patent for the first rubber thread machine, "to reduce caoutchouc or india rubber into elastic thread, calibered of different sizes."

**1833.** BRACONNET gives, in the *Annales de Chimie*, an account of a new substance which he names *xyloidine* and describes as being white, pulverulent, neutral, and very inflammable. *(To be continued)*

[1] Continued from INDIA RUBBER WORLD, October 1, 1934, p. 43.

# EDITORIALS

### Facts about Goldenrod Rubber

A RECENT news release from the United States Department of Agriculture relating to experiments conducted with goldenrod as a rubber producer was quoted widely in commercial and technical publications. Certain inaccurate statements were made that conveyed erroneous impressions to the uninformed reader. Singling out goldenrod as the most promising source of rubber was a mistake. As a matter of fact, guayule has been commercially produced in this country at the rate of 350,000 pounds monthly since August 1, 1934.

An unfortunate oversight was the failure to make clear that goldenrod is confined entirely to the leaves and that the weight of the leaves forms a very small proportion of the total weight of the plant.

Another statement that had the tendency to create a wrong inpression in favor of goldenrod follows: "So far *Solidago leavenworthii,* one of the Edison goldenrod selections, has the highest rubber content of any of the goldenrods analyzed. Specimens have produced more than 12% rubber." We question this statement.

### General Johnson Resigns

THE resignation of General Hugh S. Johnson as Administrator was recognized to be an essential part in the reorganization of the National Recovery Act. His passing out of the picture will be regretted by many who admired the forceful personality and fearless attack of the Administrator in his defense of government policies. The favorable public opinion regarding national recovery extant during the latter part of 1933 was largely due to the General's dynamic addresses and convincing arguments toward the uplift of the nation's morale.

When the first birthday of NRA was celebrated on June 16, 1934, General Johnson was felicitated by President Roosevelt for his masterful leadership in the recovery drive. Ninety-five per cent of industry in the United States had been codified by that time, and there is no doubt that this accomplishment was due to the relentless drives of the Administrator.

Then came the need of coordinating the many hundred codes covering thousands of industries, eliminating the bad features and retaining the good. This task involves a radical revision of the National Recovery Act in which General Johnson did not seem to fit, and for that reason he resigned. His daring speeches and great devotion to the NRA will give him place with the really big men of this country.

### NRA Labor Policies Favor Employes

IN RESPONSE to a questionnaire sent out by the Merchants Association to 1,347 executives of various businesses in New York, N. Y., 77% asserted the belief that the labor policies of the Government have discriminated unduly in favor of employes. Questions were:

"Has the Government's recovery program helped or retarded business activity in your industry or trade?

"Has it increased profits? Decreased profits?

"Do you think the present policy of the Government with respect to labor tends to discriminate unduly in favor of employer? Employe?"

The analysis of the replies shows that 1,368 persons responded to the first question; 619 replied in the negative, and 445 asserted it had helped. Two hundred and one said the Government's program had neither helped nor retarded business activity, and in 103 instances the replies were classed as doubtful.

Of those who answered the question on profits 165 said that the Government's program had had no effect on profits, and 68 answers were classed as doubtful.

Of the 1,347 who answered the question on labor, 89 or 6.6% said they thought the Government's labor policies favored the employer, and 1,040 or more than 77% reported that in their judgment the policies tended to discriminate unduly in favor of the employe. One hundred and ninety-one saw no discrimination against either employer or employe, and 27 replies were doubtful.

The conclusion drawn from the first question asked was that the recovery program has succeeded best in stimulating business rather than causing a really healthy growth. Business men know this to be a fact.

A POINT OF SOME IMPORTANCE IN CONNECTION WITH the international rubber restriction scheme is its incidence on the competitive strength of the various rubber manufacturing companies. This point is now of greater consequence than in the period of the Stevenson restriction scheme because more manufacturers have become also rubber producers—the leading French, British, and Italian manufacturers, as well as 3 of the largest American companies, being engaged in the rubber plantation industry on a large scale. These companies are expected to have an advantage over all other manufacturers in costs of rubber, its amount depending on the difference between their respective costs of production and the market price for that percentage of their requirements produced on their own plantations. *Commerce Reports.*

# What the Rubber Chemists Are Doing

## Selection and Use of Age Resisters in Rubber Compounds[1]

Richard A. Crawford[2]

TABLE 1. REASONS FOR USING AGE RESISTERS IN TYPICAL RUBBER STOCKS AND OTHER MATERIALS

| Material | Outstanding Specific Reasons for Using Age Resisters |
|---|---|
| **RUBBER STOCKS** | |
| Pneumatic tire tread | To improve flex resistance and increase resistance to abrasion |
| Carcass stock | To retard ply separation and lengthen flexing life in service |
| Solid tire tread | To maintain resiliency and retard tendency to blow out |
| Passenger tube stock | To improve shelf life |
| Truck tube stock | To resist high temperatures and prevent melting or stiffening |
| Air bag stock | To retard embrittlement and minimize the effect of migration of sulfur |
| Water bag stock | To retard surface cracking and to prevent oxidation of interior surface |
| Side-wall stock | To retard sun checking and flex cracking |
| Flaps | To maintain resiliency |
| Repair stocks | To maintain surface tack and stabilize the curing properties |
| Black shoe upper | To give nonbrittle shelf aging and nontacky dry heat cures, and to retard flex cracking |
| White shoe upper | To prevent chalking and cracking |
| Boot upper | To increase tear resistance and retard flex cracking |
| Soling stocks | To increase flex and abrasive resistance and flatten cure |
| Heel stocks | To maintain snap and shelf life |
| Heel lifts | To maintain elongation and permit bending after aging |
| Rubber flooring | To retard surface erosion and chalking |
| Tile | To retard surface erosion and chalking |
| Matting | To allow a cheaper original stock to be used and still maintain sufficient quality in aged material |
| Running board stocks | To maintain adhesion to metal |
| General mechanical stocks | To flatten cure and permit higher curing temperatures |
| Motor support stocks | To prevent the action of brass on the rubber, maintain resiliency, and maintain adhesion |
| Belt cover stocks | To retard flex cracking, improve resistance to abrasion, and improve the heat and corrosion resistance of the surface |
| Belt frictions | To prevent ply separation from building or operating causes |
| Gum tubing | To prevent softening and cracking |
| Colored garden hose | To retard chalking and reduce marking |
| Black hose | To prevent hardening and cracking |
| Gasoline hose | To maintain flexibility of tightly cured or overcured stock |
| Fire hose | To prevent development of acid in the tube |
| Water bottles | To prevent melting or hardening |
| Bath caps | To prevent melting or hardening |
| Jar rings | To maintain elongation |
| Auto topping | To prevent cracking from sunlight |
| Leatherette | To prevent hardening |
| Rubber-covered rolls | To maintain original hardness |
| Tank linings | To make them more corrosion resistant and prevent deterioration by materials such as copper or iron salts |
| Sheetings | To prevent development of offensive odor |
| Rubber cements | To maintain tack |
| Dipped goods | To maintain tensile and resistance to tear |
| Thread rubber | To maintain elongation and shelf life |
| Rubber bands | To maintain elongation |
| Transparent rubber | To insure good aging |
| Dental dam | To maintain tear resistance |
| Latex goods | To protect against impurities, to permit dry heat cures, to withstand sterilization |
| Sponge rubber | Very essential to insure good aging |
| Wire | To prevent stiffening and shortness of cover |
| Hard rubber | To minimize discoloration on aging |
| Sulfur-free stocks | To improve flex resistance and heat resistance |
| Low-sulfur stocks | To improve flex resistance and heat resistance |
| Latex-fiber combinations | To prevent resinification and maintain flexibility |
| Rubber base adhesives | To maintain adhesive properties |
| **OTHER MATERIALS** | |
| Balata | To prevent resinification |
| Chicle, Pontianak, etc. | To prevent resinification |
| Rosin | To prevent oxidation which catalyzes deterioration of rubber goods |
| Rosin-base adhesives | To maintain adhesive properties |
| Fly stickies | To prevent drying out of the film |
| Asphalt | To prevent checking, chalking, and cracking |
| Asphalt paint | To improve weather exposure test |
| Tire paint | To prevent deterioration of surface to which applied |
| Top dressing | To prevent deterioration of surface to which applied |
| Linseed oil | To retard drying |
| Oil-base adhesives | To maintain adhesive properties |
| Nitrocellulose and lacquers | To stabilize and prevent embrittlement |
| Paper | To prevent embrittlement |

THE research reported by this author presents in detail the effect of age resisters on processing bloom and various physical properties of unaged and aged vulcanized rubber. Space here is available only for the guide given for the choice of age resisters for specific purposes with the reasons for their use in many commercial articles.

Although the discovery and the use of certain organic accelerators resulted in the manufacture of rubber articles with good aging properties, control of aging by choice of accelerators was not a satisfactory solution to the aging problem because independent control of curing and aging properties was not possible. Such a control, however, was provided by the invention of non-accelerating age resisters. Although tensile strength is the property most used to measure aging effects, in recent years other factors have become recognized as important in influencing the choice of an age resister. Among these are the effects of age resisters on processing, bloom, and various physical properties of unaged and aged vulcanized rubber.

Age resisters are as specific in their effects on the service qualities of rubber articles as accelerators, and they must be chosen as carefully if the most desirable results are to be obtained. For example, if age resisters A and B are under consideration, and both are of equal value in bomb and oven aging, A may be of great value in increasing resistance to flex cracking; while B is of little or no value; A may have bad staining properties; while B is relatively nonstaining; A may have little value in protection against deterioration at high temperatures; while B is outstanding in this respect. It is necessary, therefore, to determine which properties are desired for a particular article and choose the age resister which will best maintain them. The choice of the best age resister for any specific use must depend upon wide experience and critical knowledge of composition and service factors involved.

In Table 1 are listed some of the reasons for using age resisters in typical rubber stocks. The fact that age resisters improve natural, bomb, and oven aging and also minimize the effect of variation in cure is common to all stocks and is not mentioned.

The ways in which rubber may deteriorate are manifold. It is often not possible to correct completely a given difficulty merely by adding an age resister. It may be necessary to change the accelerator, the accelerator-sulphur ratio, the pigmentation, or the cure. The use of an age resister, however, is always an additional improvement

[1] Abstracted from *Ind. Eng. Chem.*, Sept., 1934, pp. 931-39.

[2] The B. F. Goodrich Co., Akron, O.

TABLE 2. CAUSES AND REMEDIES FOR VARIOUS TYPES[a] OF DETERIORATION OF RUBBER COMPOUNDS

| TYPE OF DETERIORATION | CAUSE | REMEDY | COMMENT |
|---|---|---|---|
| 1. Loss of tensile strength at ordinary temperatures | Oxidation | Diaryl amines, aldehyde-amines, or ketone-amines | Use any highly active age resistor |
| 2. Decrease in elongation<br>3. General hardening | Oxidation of rubber, oxidation of free or combined sulfur, or continued cure | Same as 1 | Low-melting diaryl amines are especially good |
| 4. Tendency of highly compounded aged stocks to smudge<br>5. Chalking | Surface oxidation destroying the bonding action of the rubber for the pigments | Same as 1 | Waxes, petrolatum, or paraffin also help |
| 6. Development of odor | Oxidation, giving rise to volatile, terpene-like materials | Same as 1 | Leave out rosin oil or other readily oxidizable materials |
| 7. Oxidation catalyzed by resinous ingredients, drying oils, deteriorated rubber in compound, deteriorated rubber in contact, metal salts or soaps in compound, or contact with certain metals | The oxidation of rubber is autocatalytic | Same as 1 | In contact with easily oxidizable materials, use of age resistor is essential |
| 8. Effect of under- and overcures | ..... | Same as 1 | Age resistors flatten curing curves and impart better aging to poorly cured articles |
| 9. Effect of curing above optimum temp. | ..... | Same as 1 | Same as 1 |
| 10. Brittle skin formation | High-temp. service, surface oxidation, or surface overcure due to sulfur migration | Aldehyde-amines and certain diaryl-amines | Aldol-α-naphthylamine is recommended |
| 11. Softening by water or steam | Water penetration and reversion | Aldehyde-amines, polyprimary amines | Improvement notable in water bags and steam hose; aldol-α-naphthylamine is recommended |
| 12. Heat deterioration | Oxidation and reversion | Same as 11 | ..... |
| 13. Oxidation of solvent-swollen rubber | Swelling often affords easie: access to oxygen | Same as 11 | Effect is seen in gaskets and gasoline hose |
| 14. Oxidation of free or combined sulfur | High free or combined sulfur; overcures | Polyprimary amines | ..... |
| 15. Acid formation on oxidized surface | Moist, oxidized sulfur products retained on surface | Polyprimary amines, diaryl amines | Acid deterioration of fire hose cover |
| 16. Effect of inorganic acid materials | Acid hardening of surface | Same as 15 | Noted in tank linings |
| 17. Melting or sticky perishing | Oxidation and reversion | Same as 15 | Often seen in water bottles and pure gum articles |
| 18. Loss of adhesive bond to metal (brass-copper plate) | Softening at interface | Diaryl amines | ..... |
| 19. Copper poisoning of rubber stocks | Accelerated oxidation | Same as 18 | ..... |
| 20. Flexure cracking | ..... | Diaryl amines | Low-melting diaryl amines are especially good |
| 21. Growth of cracks on flexing | ..... | Same as 20 | ..... |
| 22. Cracking originating from dirt nuclei in stock | ..... | Diaryl amines | Eliminate dirt from stock |
| 23. Ply separation in service | ..... | Same as 22 | ..... |
| 24. Internal heating by flexure | ..... | Diaryl amines + a polyprimary amine | ..... |
| 25. Development of tack in dry heat cures | Oxidation | Aldehyde-amines, polyprimary amines | ..... |

[a] Commercial age resisters which belong to the classifications given in this table are:

Diaryl amines:
- Phenyl-α-naphthylamine
- Phenyl-β-naphthylamine
- Di-β-naphthyl-p-phenylenediamine
- Mixed ditolylamines
- Synthetic product A

Aldehyde-amine condensation products:
- Aldol-α-naphthylamine
- Acetaldehyde-aniline
- Butyraldehyde-aniline

Polyprimary amines:
- Benzidine
- 2,4-Diaminodiphenylamine
- 4,4-Diaminodiphenylmethane
- 2,4-Diaminotoluene

or factor of safety. Types of deterioration which may be remedied by the use of certain classes of age resisters are shown, together with their causes, in Table 2. It should be understood that not all members of any given group will remedy the type of deterioration given. Age resisters are often specific in their effects, and the table is intended merely as a guide in the selection of classes of age resisters suitable for the purpose in question.

# A. C. S. Rubber Division Meetings

## Chicago Group

THE Fall meeting of the Chicago Group, Rubber Division, American Chemical Society, was held at the Hotel Sherman, Chicago, Ill., October 5, with an attendance of 150 members and guests. The dinner that preceded the meeting was held in the College Inn, and everyone enjoyed the music of George Olson's orchestra and the entertainment provided by Ethel Shutta and others.

J. B. Crockett, of Heveatex Corp., Melrose, Mass., presented a paper on "Rubber in Powder Form" in which was recounted the development of the process and the outstanding features of the method of obtaining the dry rubber as a powder from sprayed latex. The paper elicited great interest, and many questions were asked regarding technical points of the process and product.

The second paper on the program, by J. P. Stanton, of the Ford Motor Co., Dearborn, Mich., outlined the purposes for which rubber is used in the Ford V-8 car. Belief was expressed that a number of economies could be effected if rubber men would give particular attention to developing compositions for specific automobile needs. A series of interesting tests were described as used by the Ford company to determine the quality and suitability of various rubber items for use in their cars. It was stated that while only a few years ago 56 pounds of rubber were used in a Ford car, 164 pounds are used in the present models. These weights include tires and tubes.

The Chicago Group has adopted a system of appointing a chairman for each meeting who shall be responsible for a program of interesting subjects. The October meeting was arranged by O. J. Urech, of Samuel Bingham's Sons Mfg. Co. Following the meeting several new members and visitors were introduced to the gathering.

## New York Group

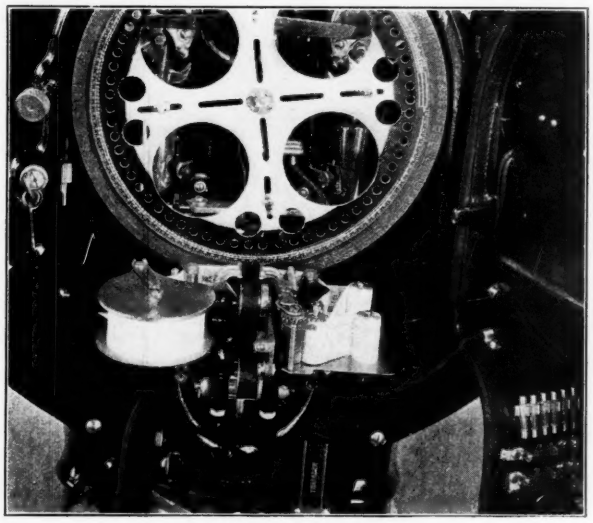
THE fall meeting of the New York Group, Rubber Division, A. C. S., held October 19 at the clubrooms of the Building Trades Employers Association, 2 Park Ave., New York, N. Y., was attended by about 130 members and guests. Following the usual dinner, Tex Ritter, cowboy radio artist, entertained with the characteristic songs of the plains, to his own guitar accompaniment.

The feature of the evening was the intensely interesting lecture by W. B. Wiegand on "My Experiences and Observations in the Far East." The human, social, and business proclivities of the Japanese and Chinese were especially depicted. In rubber manufacturing he revealed that the Japanese, as contrasted with the Chinese, utilize practices and equipment as modern and progressive as those of Americans. China, Mr. Wiegand stated, is the land of opportunity for the younger experienced technician who seeks both romance and adventure, in a land that needs an abundance of modern and progressive influences in business development.

Malaya affords another striking contrast to China. Here business proceeds

(*Continued on page* 64)

# New Machines and Appliances



Toledo Printweigh


Fox Valve

## Printweigh

THE manufacturer of the Printweigh mechanism stresses the view that scales are not manufacturing equipment. Although located in the factory and operated by factory employes, they are actually accounting machines placed in the factory to obtain important basic accounting facts.

The Printweigh is a new precision device which makes the recording of weights as accurate as the actual weighing, eliminating every possible human error of reading weight, remembering, and recording it. It is in no sense a complicated mechanism; it is electrically operated and may be used with any Toledo Automatic Dial Scale. It may be furnished in any weight capacity from 50 to 50,000 pounds.

The illustration pictures the internal arrangement of the instrument, the essential features of which follow. In place of the scale indicator, there is a lightweight aluminum-alloy disk. This weighs no more than the indicator itself and imposes no burden on the weighing mechanism. The weights are printed from a row of raised figures, located on this disk. The ticket or paper strip is placed between the printing disk and the squeeze platen; the inked ribbon comes between the ticket and the platen. The printing ribbon is automatically fed and rewound and is good for many thousand impressions. At the touch of the operating button, the back platen and the squeeze platen come together with a quick, firm pressure. Printing is positive and instantaneous. The printing of the record causes no delay whatever. The entire printing operation is performed in less than 1/10-second.

The Printweigh is remarkably flexible in the range of its application. A single ticket may be used, or it is possible to use a continuous strip record similar to a stock ticker tape. The strip is inserted as a roll and is automatically fed through the printing mechanism with the printed records spaced as shown in the illustration.

The strip can be extruded through the door and removed, or it can be wound up inside, under lock and key, and held for removal by the properly authorized employe. A double strip can also be used, providing duplicate records. After printing, the strips can be wound separately, inside, if desired; or both strips can be extruded through the door for immediate removal; or one strip can be wound inside, and one extruded through the door. In some applications it is desirable to record individual weights on tickets and carry a strip record of all weights inside, for totalizing purposes. This feat also is possible. In fact, as many as 4 copies of a record can be made simultaneously. Toledo Scale Co., Toledo, O.

## Holder for Compound Cards

A CONVENIENT stand for holding rubber compound formula cards may be readily constructed by using a 10-inch square board ⅞-inch thick as a base. In the middle of this a hole is bored to receive a 1-inch dowel as a vertical support for a rectangular board of ½-inch stock sufficiently wide to hold a couple of formula cards side by side. Spring clips are fastened near the top edge of the board to hold the cards in reading position. A stand of this sort is convenient in the laboratory for weighing out experimental mixes. It could also be used with advantage in production compound rooms.

## Thermostatic Valve

THE illustration represents a moderately priced thermostatic valve that will accurately control temperature and pressure for innumerable commercial, industrial, and chemical purposes. These valves are easily installed in a few minutes and need no complicated or expensive electric wiring. Allowance for both intermittent and continuous operation, as desired, is provided for in these controls by having 2 metering valves for any type of accurate adjustment that may be required. Fox Engineering Co., Boston, Mass.

## 36-Hour Floor Repairs

CONCRETE, wood, brick, asphalt, or composition floors that have become rutted, rough, or broken may be repaired or completely resurfaced and made ready for truck traffic in 36 hours by means of a new material known as Stonhard Resurfacer, which provides a tough, resilient surface which is waterproof, dustless, and non-skid. It can be applied with an ordinary trowel. Extensive preparation is entirely eliminated, and any handy man can make permanent repairs to all types of floors and platforms. Stonhard Co., 401 N. Broad St., Philadelphia, Pa.

## Printing Plate Vulcanizer

MANY types of molded specialties have very exacting dimensional specifications. In this respect they are like printing plates, both molded and cut-out types. The manufacture of such items is usually attended with high and costly rejects, owing to lack of suitably designed and conditioned curing equipment.

A self-contained, electrically heated, oil hydraulic, single-opening platen vulcanizer has been recently developed for precision work. The accompanying illustration shows this neat cabinet-like piece of equipment, which can be installed ready for operation by plugging into a 15 to 25 ampere circuit line.

Each 24- by 20-inch deck is of a non-warping, non-springing construction, consisting of a very thick block of solid steel to which is immovably attached a 2-inch thick, accurately surfaced, steel face plate containing multiple heating elements. The line of attachment is rigid, yet cut with dead air cavities to prevent heat dissipation.

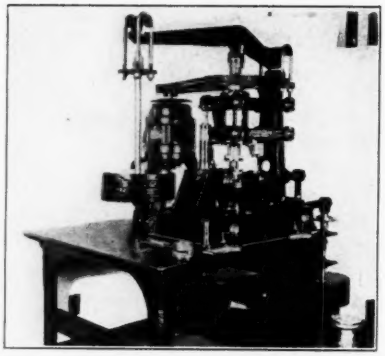
The frame consists of a base, casted with oil reservoir, and vertical side members of thick wide steel slabs. The top deck is mortised firmly between these at the top; while the bottom platen uses them as slip-guides. Integrally fastened between the side members, immediately beneath and supporting the lower platen, is a twin ram pot steel casting with 2, 6½-inch rams. The space between this casting and the base below houses a motor driven hydraulic oil pump and piping.

Attached to the front at proper height is a steel work shelf; the under structure of which contains all necessary heat and pressure controls and adjustments. H. H. Heinrich, Inc., 200 Varick St., New York, N. Y.

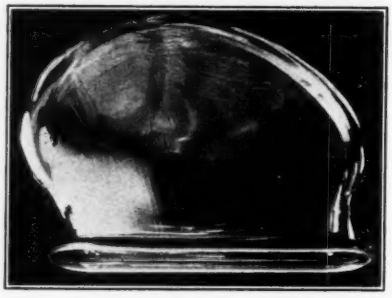
Heinrich Electric-Hydraulic Vulcanizer

## Glass Dipping Forms

PYREX brand glass shapes are a recent development in the production of various forms for the manufacture of dipped goods. Considering the value of Pyrex forms, the rubber articles to be produced from them should be large in amount to minimize the expense which otherwise would in most cases be prohibitive. The illustration shows one of these forms for bathing caps.



Breakdown Testing Machine



Pyrex Glass Bathing Cap Form

The advantages of these forms are very important. Their extremely smooth surface imparts its counterpart to the dipped article as a superior finish. Unlike forms made from ordinary glass, Pyrex forms can be suddenly heated or cooled without breakage. Their surface will not craze or check as with certain types of molds. Frequently also these forms can be made lighter in weight than corresponding ceramic forms. Another practical feature of particular commercial advantage to the dipped goods manufacturer is the ease with which designs or designations can be molded on Pyrex forms and correspondingly reproduced in the rubber article. Corning Glass Works, Corning, N. Y.

## Automatic Production Spray Gun

THE spray gun illustrated is new in principle, design, and all around efficiency. Its outstanding feature is automatic synchronizing of materials and air, both controlled by a single adjustment. It affords distinct advantages over the usual type of spray gun in that the operator is not obliged to stop each time he wants to change widths, for the air is so controlled that changes can be made constantly while the gun is in operation, and all materials can be sprayed with equal success. A special adjustment is provided for shading so that a large volume of air may be used with light material, producing very effective results.

This gun is used as well for spraying latex and in rubber molding departments for spraying lubricant in the molds to prevent sticking of the product. L. Wechsler, 401 Broadway, New York, N. Y.

## Laboratory Tester

A NEW laboratory machine for evaluating breakdown characteristics of rubber compounds is here illustrated. It differs from previous machines in that the actual forces producing flexing in the sample can be measured at all times, and results can be evaluated in terms of energy units rather than on a time basis alone.

A specimen 1½ inches in diameter and 1½ inches long is placed between 2 parallel faces and constant vertical load applied, which produces variable compressions in the sample, or the compression can be maintained constant by varying the load. The upper face is driven at 875 r.p.m. The lower face is rotated through the sample, but is carried on a track wherein its axis can be thrown off the axis of the upper face any desired amount, producing angular flexing and distortion of the sample. The force required to maintain the axis differential or horizontal deflection between the 2 plates is definitely measured by means of a platform scale, and these flexing forces produced in the rubber test specimen can be followed throughout the test.

Stocks may be compared under conditions of "Constant Load" producing variable horizontal deflection as under "Constant Deflection" producing variable horizontal load. The end point, or first indication of failure, is actually indicated by the scale. The effect on breakdown characteristics due to changes in volume loadings, types of pigment, and other compounding variations can be studied. Tests on commercial stocks show excellent correlation with actual road tests on tire and carcass compounds. Rubber Laboratory, St. Joseph Lead Co., Josephtown, Pa.


"Master" Spray Gun

# New Goods and Specialties

## Basketball Bladder

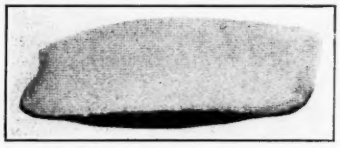
BASKETBALL players will take great satisfaction in using the improved valve balanced bladder. By its construction this bladder completely removes the dead spot, gives better "dribbles," and a truer rebound off the back board. It rolls perfectly, never favoring the valve side because it is balanced top and bottom. Furthermore it is the easiest to replace in the cover.

Its structural features, shown in the illustration, comprise a lightweight rubber disk pierced with 3 molded slots and sewed to the leather case of the ball. The slots serve as anchorage of the bladder in fixed position by receiving the 3 flexible prongs attached to the bladder around its valve. Diametrically opposite this prong and slot device is located a balancing piece of soft rubber which assures uniformity in rebound, bounce, and rolling. A. G. Spalding & Bros., 105 Nassau St., New York, N. Y.

## New Basketball Shoe

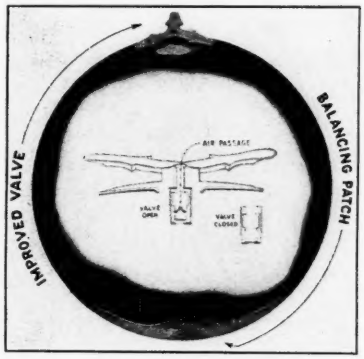
AN IMPROVED basketball shoe that already has met with wide response is shown in the accompanying illustration. It has a gun metal leather upper reenforced with webbing to prevent stretch and equipped with ventilation holes. This footwear also boasts a special snug fitting last, laced to toe pattern, and shock absorbing heel. The outstanding feature of the shoe, however, is its special "Nu-Foot" molded rubber sole designed to fit the shape of the human foot. Non-skid and durable, this sole is vulcanized and attached so that it cannot come loose. But the shoe can always be resoled. Brooks Shoe Mfg. Co., Swanson and Ritner Sts., Philadelphia, Pa.

"Nu-Foot" Rubber Soled Footwear



*Bull. Rubber Growers' Assocn.*

"Mystic Marvel"




Improved Bladder


German Key Attachment

## Rubber Cleaning Pad

IN THE London stores appears a cleaning pad, known as "Mystic Marvel," that can be used for many and varied purposes around the house. One side of this pad is covered with smooth sole crepe; while the other side is a rough-surfaced brown crepe. "Mystic Marvel," when wet with a cleansing agent applied, is said to remove stains from sinks and baths or grease from stoves. When dry, it is recommended for polishing cars, as a dry cleaner for clothing, hats, and suede shoes, or as a dog brush.

## Patent Key Attachment of Rubber for Hotels

HOTELS constantly confronted with the loss of room keys will welcome this patented elastic rubber key attachment. It will not damage doors or cause disturbing noises when locks are being closed. As the fittings are of nickeled brass, they are rustless. This attachment is easily cleaned by washing, and the colors and inscriptions thereon are fast to washing.

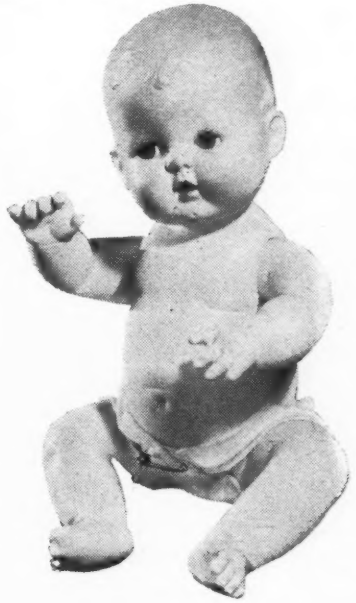
This device, obtainable in 2 sizes, comes in the following high-gloss-finish colors: blue, green, red, violet, white, yellow, and brown. To distinguish the different floors, several colors may be selected. The name of the hotel, the room number, etc., are printed on the attachment as desired. Rheinische Gummi-Gesellschaft W. Klotz & Co., Dusseldorf, Germany.

## New Rubber Doll

THE Miller Rubber Products Co., Akron, O., recently announced a new standard bearer for its complete line of rubber dolls, called the "Baby Glee." One of the features of this new doll is its unbreakable hard rubber head with movable blue or brown eyes and lashes. Jointed head, legs, and arms add to its appeal.

"Baby Glee" comes in 4 sizes: 10, 14, 16, and 18 inches high. Like all other products in the Miller line, it is sold undressed, but a wide variety of complete layettes is offered with it. Each doll is cellophane wrapped, packed individually in a bed-type box with a rubber mattress.

Besides "Baby Glee," Miller features its "My Dolly" rubber doll, with unbreakable head of "Millite" construction, movable glass eyes and lashes, jointed head, legs, and arms; and its "Milly," "My Darling," and "My Mandy" dolls. Each is of a specially compounded rubber which has a flesh-like feel and can be washed repeatedly without hurting its finish, peeling, or losing its smoothness.



"Baby Glee"

# Rubber Industry in America

## OHIO

PRODUCTION in nearly all lines of manufactured rubber goods is proceeding very moderately, except for transmission belting. In that line mechanical goods manufacturers are busy with orders from industrial concerns which are replacing outworn belting for their machinery and conveyer equipment.

Tire manufacturers in Ohio report that business did not improve since price fixing became effective May 14. To that date business had been ahead of that during the similar period in 1933, but when details of price fixing became final and public, business dropped considerably and remained at a low level until the present time. Now, however, since price fixing has been abandoned, dealers have assumed a different attitude: they seem to feel they are better able to do business now that the yoke has been removed from their necks.

Retail tire sales have picked up in the last few weeks, but production has not kept pace because the rubber industry, heavily stocked during the summer, has gradually been depleting that inventory. Whether or not production will increase soon rests to a large extent with operations in the automobile industry, reports of which to date are not so optimistic.

The tire industry at present is more concerned with a price advance than with anything else, for today's selling prices are based on costs established a year or so ago, costs which have greatly increased since that time.

Optimism, however, has crept into the tire industry. The outlook for winter business is that it will be at a very respectable level. A hot, dry summer, such as recently experienced, has a very direct effect on tire wear. Besides gasoline sales are close to 1930 levels. The encouraging improvement in the rural market also should benefit tire sales.

Sundries and specialties manufacturers report that since the near breakdown of the NRA the constant change of policies has unsettled consumers. The constant speculative talk of the prices of commodities likewise has upset buying. Yet the industry anticipates a fair business for fall and winter.

Employment in rubber factories in the Fourth Federal Reserve district, which includes all of the State of Ohio, declined somewhat in July from May and June, but was said to be 25% higher than for July, 1933. The employment drop is partly due to the seasonal lull experienced by rubber factories during the summer and partly to heavy buying in previous months.

O. C. Pahline

### Flooring Manager

Twenty years with Goodyear is the proud boast of Otto Carl Pahline, manager of the flooring department. He joined the Goodyear Tire & Rubber Co. in 1914 as an adjuster, serving in Albany and Chicago. From 1916 to 1917 he was salesman in Chicago and Providence. Then he acted as manager of branches at Providence, Seattle, and Spokane. In 1926 he was made manager of golf ball sales, with headquarters in Akron. The next year, though, he became manager of tube sales and in 1929 was appointed to his present post. Mr. Pahline also is chairman of the rubber flooring division of the Rubber Manufacturers Association, Inc., and of the NRA rubber flooring divisional authority as well as a member of the code authority, Code 156, NRA.

His birthplace is Worcester, Mass.; the day, December 24, 1890. His Alma Mater is Brown University, which awarded him a Ph.B. degree in 1913. His clubs are Brown, Portage Country, Alpha Tau Omega, and Masons. Besides he is an associate member of the Society of Naval Architects and Marine Engineers. His address is 1492 Jefferson Ave., Akron.

---

**The Damascus Mfg. Corp.,** Cleveland, has developed a new pliable lacquer for use on rubber goods. It is said to be resistant to wear and exposure and will not crack under severe strain.

**Emery Industries, Inc.,** Cincinnati, is developing a new softener for rubber, which is expected to be ready for the market shortly.

**Russell B. Koontz,** well-known rubber machinery expert, formerly president and general manager of Adamson Machine Co., and also secretary and treasurer of The Universal Engineering Corp., both of Akron, has gone into business under his own name at 109 N. Union St., Akron, as a rubber consulting engineer specializing in appraisals and new and used rubber machinery.

**Automotive Service Industries Show** will be held, November 19 to 23, at Cleveland's New Exposition Hall under the joint sponsorship of the National Standard Parts, the Motor & Equipment Manufacturers, and the Motor & Equipment Wholesalers associations. The MEMA will hold an informal members' dinner meeting at Hotel Cleveland on November 20, which will be the annual business meeting. New officers and directors for 1935 will be presented.

**The Patterson Foundry & Machine Co.,** East Liverpool, has elected D. M. Wilhelm, for the past 4 years sales manager, secretary of the organization. He is succeeded in his former post by E. M. Underwood, division sales manager.

**The Premier Rubber Mfg. Co.,** 1 Edmund St., Dayton, manufacturer of mechanical and hard rubber products, now also does custom work in DuPrene, synthetic rubber developed by E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., which was found especially suitable for articles or parts subjected to the action of oil or oily products. John Westendorf is treasurer and general manager of the Dayton concern.

**Burke Golf Co.,** Newark, through its *Burke Golf News* has been holding prize contests for golf professionals, which aroused considerable interest. Now, with the cooperation of *The Sporting Goods Dealer,* the company is conducting a new contest for sporting goods dealers only. The prize is 6 Burke "Forespot" golf balls.

**Marine Tire Corp.** recently moved to more spacious quarters at 151-55 E. Market St., Akron. President S. J. Gottlieb has been in the tire business 21 years.

**Frank A. Seiberling,** president of the Seiberling Rubber Co., Akron, who celebrated his seventy-fifth birthday October 6 at a banquet given in his honor by 340 prominent civic and business leaders, received a leather bound scroll bearing a touching tribute and signed by all the guests there. Among those present were Cyrus Eaton, C. W. Seiberling, Harvey S. Firestone, Sr., and Paul W. Litchfield

**The Vulcan Tool Co.,** Dayton, recently acquired an additional well-equipped plant for the sole purpose of producing mechanical rubber molds. The firm, which does designing and drafting, also makes gages, tools, dies, jigs, fixtures, and special machinery. Company executives follow: Lee A. Jones, president and treasurer; Lee W. Jones, vice president and assistant treasurer; and Wm. G. Pickrel, secretary.

**Standard Chemical Co.,** chemical manufacturer, has moved from 320 Beacon Journal Bldg. to 609 Akron Savings & Loan Bldg., Akron.

**The Goodyear Tire & Rubber Co.,** Akron, has announced that Hugh Allen, former director of public relations for Goodyear Tire and the Goodyear Zeppelin Corp., is back in the publications office at the Akron plant after several months at the company's offices in Los Angeles, Calif. Noble R. Miller, formerly manager of Goodyear's Plant 1 Labor Department, recently left Akron for Sydney, Australia, where he will be personnel manager of the plant there, succeeding E. W. Machan, transferred back to Akron. A. J. Slay and J. P. McGrath, who were in Akron attending the Interplant Conference, returned to Sydney with Mr. Miller. The federal trade commission hearing on the Goodyear case, in which the company was charged with violation of the Clayton Anti-Trust Act, was recessed in Chicago, Ill., October 11. Hearings were resumed in Akron on October 22.

**The B. F. Goodrich Co.,** Akron, through E. H. Barder, general superintendent of the tire division, has announced that Earl Gulick, production superintendent of the division, was transferred to the Canadian Goodrich Co., Ltd., Kitchener, Ont., as plant superintendent. He is succeeded in the Akron post by H. B. Cash, former shift superintendent. Joining Goodrich in 1927, Mr. Gulick was production superintendent in the Akron plant for nearly 3 years. Mr. Cash joined Goodrich in 1919 and was shift superintendent 4 years.

**The Globe Chemical Co.,** Cincinnati, announces plans for the general expansion of its business within the next few months, which will enable the company to broaden its sales territory for several types of rubber compounding chemicals.

**The French Oil Machinery Co.,** Piqua, recently developed and placed in several leading rubber plants, several improved types of hydraulic presses. T. F. Stacy, head of the hydraulic press department, reports a very satisfactory volume of sales throughout the present year.

**The Summit Industrial Instrument Co.** moved its plant from 60 Cherry St. to 93 Miller Ave., Akron, where an entire building is occupied. Glenn H. Seely is head of the company, which makes a number of indicating, recording, and controlling instruments used in rubber plants.

## NEW ENGLAND

MANUFACTURERS of rubberized clothing in New England saw sales rise considerably the past month. Part of this increase can be attributed as seasonal; yet sales are greater than they were a year ago. Proofers, naturally, and rubberizers of fabric were extremely busy during September and October, but other fields of the rubber industry were generally quiet. Nearly all look forward to at least normal business this winter. The tire industry, however, feels that owing to the uncertainty in respect to price, conditions this winter will be no different from those of the past several years.

In its monthly report on payrolls in Rhode Island, Brown University Bureau of Business Research showed that the September payroll in the rubber industry was 7.9% larger than that of August: $229,570 against $212,736.

**Seamless Rubber Co.,** New Haven, Conn., according to Joseph Bennett, manager of the sporting goods division, will offer snappy new styles in rubber bathing suits for 1935. This year the company enjoyed quite a demand for its rubber swim suits.

**Spencer Thermostat Co.,** 34 Forest St., Attleboro, Mass., has announced that Victor G. Vaughan, until recently manager of the appliance engineering division of Westinghouse Electric & Mfg. Co., has become associated with the Spencer concern, in charge of all operations including development of new products.

**The National Sherardizing & Machine Co.,** Hartford, Conn., has purchased the complete equipment of the Clyde E. Lowe Co., Cleveland, O., manufacturer of circular mandrels used in the rubber industry here and abroad. Patent to cover their manufacture also was acquired.

---

**The Colonial Insulator Co.,** Akron, maker of one piece, closed end forms for dipped rubber goods, reports a number of excellent orders recently received from various foreign countries.

---

### Company Reports

**Boston Woven Hose & Rubber Co.,** Cambridge, Mass. Year ended Aug. 31: net income after depreciation, taxes, expenses, and other deductions, $13,853, equal, after 6% preferred dividends, to 80¢ a share on 86,000 common shares, against $54,991, or 12¢ a common share, in the year ended Aug. 31, 1933.

**Faultless Rubber Co.,** Ashland, O. Year ended June 30: net income, after depreciation, federal taxes, and other charges, $204,163, equal to $3.12 a share on 65,450 common shares, against $121,964, or $1.68 a share on 72,722 shares in the previous fiscal year.

**Black Rock Mfg. Co.,** Bridgeport, Conn., manufacturer of many varied types of rubber plant machinery, opened an export office at 277 Broadway, New York, N. Y., to handle the company's growing foreign business with greater facility.

**Angier & Earle, Inc.,** manufacturer of shoe factory finishes and latex cement, because of increasing business was compelled to move to larger quarters at 120 Potter St., Cambridge, Mass.

**Rhode Island Rubber Club** plans a tentative meeting for the latter part of November although the program of the meeting has not yet been decided upon. Secretary J. Eagleson, who resigned, is succeeded by Lawrence D. Walker, of Collyer Insulated Wire Co., Inc., Pawtucket, R. I.

**The Providence Insulated Wire Co.,** Providence, R. I., was awarded contracts from the United States Government aggregating $3,009.90 for furnishing wire and other materials to the Navy Department.

**Phillips-Baker Rubber Co.** is making extensive alterations and improvements to one of its buildings on Westfield St., Providence, R. I.

**United States Rubber Co.** in a recent announcement revealed that it spent over $75,000,000 for materials in Rhode Island last year. This sum does not include the hundreds of thousands of dollars paid in salaries and wages by the company to its employes in its factories at Providence, where druggists' supplies, thread, golf balls, aprons, bathing apparel, rubber tiles for flooring, soles and heels, tank linings, and numerous other articles are manufactured; and at its plant in Bristol, where all kinds of insulated wire are made. The great expenditure included a wide variety of articles such as silk yarn, cotton yarn, fuel oil, machinery, paper boxes, hardware, molds, dies, castings, wooden boxes, electrical equipment, steel forgings, balata resin, glass, and ice.

**Proofers Credit Group,** recently organized by credit managers of the rubberizing industry selling to the raincoat and sportswear trade, held a meeting at the Chamber of Commerce Bldg., Boston, Mass., October 22. The aims of this group are to reduce credit losses through periodical clearances and round table meetings and to discuss credit problems in the industry, thus encouraging cooperation within the industry. The National Credit Office has been retained to make clearances and edit financial reports, with John O. Webb, of the Credit Office, in charge of this work. Officers of the Proofers Group for 1934-35 are Walter R. Carlson, of Plymouth Rubber Co., Inc., Canton, Mass., president, and J. A. Hudson, of Arrow Products Co., Watertown, Mass., secretary-treasurer.

## OBITUARY

### Veteran Rubber Man

HEART disease caused the sudden death of Charles S. Eddy before his home in Akron, O., on October 1. The deceased, who was born in Jamestown, N. Y., 74 years ago, joined the B. F. Goodrich Co., Akron, in 1880. After 27 years there, lastly as traffic manager, he went to the Ohio Rubber Culture Co., Canton, O. He retired from business activities several years ago.

Mr. Eddy, who was quite active in Akron club and Masonic circles, leaves his widow and a daughter.

Burial was in Glendale Cemetery.

### Rubber Executive

JOSEPH EDWIN DAVIS, widely known rubber sales executive and plant manager, passed away in sleep at the Holland Hotel, Beacon, N. Y., on September 25, 1934. He was a native of Massachusetts, born at Lynn, September 11, 1859. After graduation at Harvard in 1883 he devoted practically his whole life to the rubber industry, specializing in the production and sales of mechanical rubber goods.

His rubber career began in 1884 with The Boston Woven Hose & Rubber Co., Cambridge, Mass. A year later he became treasurer and manager and in 1890 established a branch office for the firm in San Francisco, Calif. He continued with this company until its dissolution in 1900. At that time he became manager of the Mahoning Rubber Co., Youngstown, O. After that company reorganized as The Republic Rubber Co. he became sales manager of the Continental Rubber Co., Erie, Pa. From 1912 to the close of his life he was connected with the New York Rubber Co., Beacon, in sales management and plant operating capacities.

His sterling character, marked executive abilities, and genial manner gained for him the esteem and friendship of a wide circle of social and business friends. He was interested in the civic affairs of Beacon, golfing, and yachting, was a member of the Harvard and other clubs. In recent years he resided at his farm in Newtown, Conn.

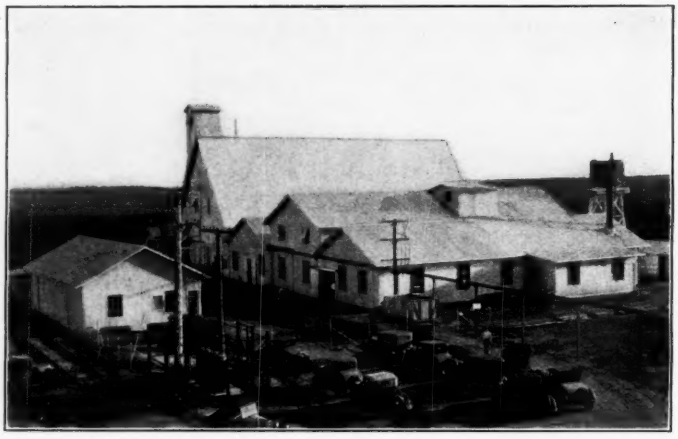
Mr. Davis is survived by his son, Edwin S. Davis, plant manager of The New York Rubber Co., Miss Helen Davis of New York, and another son, J. Stanwood Davis, of Seattle, Wash. Mr. Davis also leaves behind him 3 sisters.

Interment was at Portland, Me., where the late Mrs. Davis was buried some years ago.

### Ernest Jacoby

ERNEST JACOBY, the well-known Boston rubber man, died quite unexpectedly late last month. A suitable obituary will be published in the forthcoming number.

## PACIFIC COAST



**Guayule Rubber Plant, Salinas, Calif.**

*American Rubber Producers, Inc.*

MANUFACTURERS of mechanical rubber goods in California report that present business is much better than last year's, with indications of further gains during the winter.

The situation of automotive accessories, such as floor mats, radiator hose, running board matting, etc., is held deplorable, and it is hoped that means will be evolved whereby this phase of the industry will become satisfactorily controlled, as is the case with mechanicals. The trouble seems to have started when a few of the smaller manufacturers in the East catering to the automotive end cut prices; then all the larger manufacturers made their cuts national instead of meeting prices in only those localities previously mentioned, thus disrupting the entire national set-up.

**Desser Tire Products,** 6211 Cottage St., Huntington Park, Calif., according to P. F. Mekeal has recently installed full-circle retread equipment to comply with the demands of the trade, resulting in a very satisfactory set-up. Jerome Desser has been appointed manager of the company's Los Angeles, Calif., retail stores. The company reported also that business has improved in the past 9 months from a volume standpoint; and it expects 1935 to show considerable improvement in the rubber industry.

**Featherlike Pneumatic Products Co.,** 5911 So. Broadway, Los Angeles, Calif., manufactures balloon fabric and rubber pneumatic mattresses, air cushions, pillows, and auto back rests, pneumatic surf boards, rubber specialties, and fishing waders and does advertising and motion picture balloon work. The firm also makes mattresses to order on specification as well as special sizes to fit cars, with seat backs cut for sleeping. The factory accommodations are not limited solely to the manufacture of air mattresses, but can be utilized to build any pneumatic product. Arthur A. Lenkeit, who has invented some of these "Featherlike" products, is owner and general manager of the concern.

### Calpar Rubber

The American Rubber Producers, Inc., a subsidiary of Intercontinental Rubber Co., started its Salinas, Calif., plant for continuous operation beginning with the opening of the guayule harvest in August. Guayule seedlings are planted annually, and the shrub matures in 4 years. The bushy plants are uprooted when harvested; therefore yearly planting is required for annual crops. The rubber occurs throughout the plant as dry rubber.

The entire growth is reduced to fine pulp, and the rubber separated by flotation, washed, and vacuum dried for boxing in block form. The process is patented and continuous, yielding perfectly clean rubber marketed under the brand name Calpar. This rubber is highly esteemed because of its valuable properties that facilitate plasticizing, friction coating, calendering, and extruding.

Production at the Salinas plant has been at the rate of 350,000 pounds per month since August 1, 1934.

### Canada

From Canada come reports that business this year is better than during 1933. The rubber footwear industry, as expected, showed a considerable increase in sales the past few weeks, and this demand will gain as the season of the year is approached in which the consumer will need rubber footwear. The tendency the last year or so has been for dealers to delay placing their requirements until the last moment. This policy is almost entirely due to the financial condition of most dealers and possibly to greater care on their part in committing themselves to pay for goods that will not give them an immediate turnover.

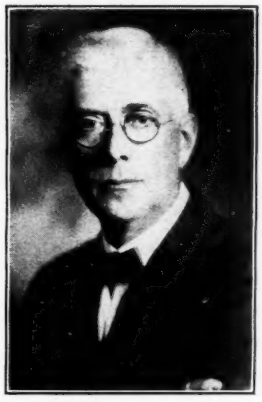
## EASTERN AND SOUTHERN

REPORTS indicate that during the first half of 1934 the rubber manufacturing industry in the East experienced good business, but a recession set in with the third quarter of the year. Outlook for the near future is not so optimistic; manufacturers at best are hoping for normal business. Much depends, of course, upon the automobile industry and construction activities. Here again the unfortunate tire price situation is held as a check on sales.

**American Cyanamid Co.**, 30 Rockefeller Plaza, New York, N. Y., in reorganizing its various divisions and subsidiaries, has divided the main lines of the domestic business as follows. The parent company and its wholly owned subsidiary, the Amalgamated Phosphate Co., will handle the fertilizer business; while the parent concern also will operate the mining chemical and beetleware businesses. The American Cyanamid & Chemical Corp., through its various departments and divisions, will directly operate in heavy, industrial, and paper chemicals, explosives, insecticides, and gypsum. Calco Chemical Co., and its subsidiaries, continue with the business in dyestuffs, rubber chemicals, and pharmaceuticals. Chemical Construction Corp. continues the engineering and construction business. Lederle Laboratories, Inc., continues the business in biological products for human and veterinarian use, and its subsidiary, Davis & Geck, Inc., goes on devoting itself exclusively to surgical sutures and ligatures.

**The Industrial Materials Exhibit** was held October 15 to 19, 1934, at Park Central Hotel, Seventh Ave. and 55th St., New York, N. Y. Among the exhibits was that of The Brown Co., Philadelphia, Pa., manufacturer of electrical recording instruments used in the regulation of industrial manufacturing processes including those in rubber. A comprehensive display was also shown by the American Hard Rubber Co., 11 Mercer St., New York, manufacturer of hard rubber products for industrial and utilitarian purposes in well-known variety too numerous to mention in detail.

**S. S. Long,** for many years president of the Coatings Corp. and The Republic Varnish Enamel & Lacquer Co., recently joined Ault & Wiborg Corp., 75 Varick St., New York, N. Y., as director of the rubber goods and textile division, taking with him his technical and manufacturing personnel. For several years these companies enjoyed a large share of the rubber trade, consequently are familiar with the requirements of the industry. The new arrangement, allowing increased facilities for investigation and for more extensive fundamental research, undoubtedly will result in new developments in the field.



*W. Burden Stage*

A. F. Townsend

### Advisory Member, I.R.R.C.

The directorate of The Rubber Manufacturers Association, Inc., on October 3 appointed its chairman, Colonel Arthur F. Townsend, who is also chairman of the board of Raybestos-Manhattan, Inc., as a member of the Advisory Panel of the International Rubber Regulating Committee. He sailed on the "Majestic" on October 12 to attend an important meeting of the committee in London on October 30.

Mr. Townsend has long been prominent in the rubber industry and is well qualified for the signal honor conferred upon him. He began his rubber career with the New York Belting & Packing Co. Later, an incorporator of the Manhattan Rubber Mfg. Co., he served successively as its secretary-treasurer, vice president, and president, becoming chairman of the board when the firm was taken over by Raybestos interests. Colonel Townsend is also a veteran of the Seventh Regiment and of Squadron A, N. G. N. Y.

### Rubber Code News

#### Official Orders of NRA

Code No. 156: Order 34, denying application of M. Rudolph & Co., De Kalb, Ill., for an exemption from the provisions of Chapter 10, Article III-B, Section 2, relating to pay of apprentices or learners, and asking for 20 additional apprentices, as applicant is unable to obtain skilled help in that locality.

Code No. 156: Order 36, denying application of the Hagerstown Rubber Co., Hagerstown, Md., for an exemption from the provisions of Chapter VI, Article III-A, Section 4, of this Code, relating to price finding.

Code No. 156: Order 37, approving uniform accounting manual for the Rubber Manufacturing Industry.

Code No. 156: Order 38, granting the application made by the divisional Code Authority for the Mechanical Rubber Goods Division of the Rubber Manufacturing Industry for approval of Group Customer Classification Definitions in accordance with provision of Article III-A, Section 1, Chapter VII of said Code.

"Cooperative Associations," defined as syndicate buyers in the group customer classifications for the mechanical rubber goods division, include: distributer, jobber, and mill supply house, dealer, mail order house, chain store, department store, syndicate buyer, equipment manufacturers, industrials, government, consumer.

"Consumer" is defined as "any person, firm, corporation, or other form of enterprise other than industrials as hereinabove defined, which purchases the products of the division for his or its own consumption and not for resale purposes."

"Syndicate buyer" is defined as "any person, firm, corporation, or other form of enterprise which acts as a purchasing agency for products of the division for its clients' own buying organizations, and including all bona fide and legitimate cooperative associations."

#### Complaints Committee

The NRA has appointed the following trade practice complaints committee for the rubber manufacturing industry: T. J. Needham, United States Rubber Co., New York, N. Y.; H. N. Young, Hamilton Rubber Mfg. Co., Trenton, N. J.; M. I. Woythaler, Hodgman Rubber Co., Framingham, Mass.; and Paul Cherington, Administration Member.

#### New Jersey State

An action recently filed in the Trenton, N. J., District Court by the State Code Authority of the Retail Rubber Tire and Battery Trade against Israel Richmond, proprietor of Richmond's Tire Shop, Trenton, to collect an assessment of $500 due the code authority has been discontinued, for Mr. Richmond made a settlement.

The Cotex Corp., 331 Oliver St., Newark, N. J., was fined $1,000 in Federal Court at Trenton by Judge Philip Forman for slashing prices. Sales Manager Otto Fried pleaded guilty in behalf of the firm, specifically charged with price slashing on at least 10 occasions. A fine of $100 was imposed for each offense. This conviction was the first of a rubber manufacturer under NRA policies.

#### Crude Rubber Importers' Code

A public hearing will be held November 8 in Room 2062, Department of Commerce, Washington, D. C., on a supplementary code for the crude rubber importing trade, submitted by the Rubber Trade Association of New York as a supplement to the general code provided for the rubber importing trade.

The following names for crude rub-

ber are recommended for commercial use by the Rubber Manufacturers Association, Inc.

| Rubber: | Grade | | | | | |
|---|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 4th | 5th | 6th |
| Ribbed Smoked Sheets | No. 1X | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 |
| Thick Latex Crepes | No. 1 | No. 2 | | | | |
| Thin Latex Crepes | No. 1X | No. 1 | No. 2 | | | |
| Brown Crepes | No. 1X | No. 2X | No. 1 | No. 2 | No. 3 | |
| Blanket Crepes | B | | C | D | | |

The foregoing grades for crude rubber are not used in labeling rubber products sold over-the-counter.

## Rubber Products

A.S.T.M. Committee D-11 on Rubber Products has developed a number of changes in the standards under its jurisdiction; these were recently approved by the Society. Because of considerable criticism of the Tentative Specifications for Rubber Insulating Tape (D 119-32 T), particularly concerning the fusion test and quality requirements, the specifications have been completely rewritten.

The Tentative Specifications for Insulated Wire and Cable: Class AO, 30% Hevea Rubber Compound (D 27-33 T), were revised in June, and now by the completion of tables on thickness of insulation and test voltage, are considered to be in acceptable form.

## Well-Known Chemist

An interesting and successful career has had Merwyn Clarence Teague, in charge of Lotol and latex sales, Naugatuck Chemical Co., and of rubber dispersion sales, Dispersions Process, Inc., both of 1790 Broadway, New York, N. Y. He was born in 1890 in Pendleton, Ind. In 1914 he was graduated from Wabash College. Princeton University conferred an A.M. on him in 1917 and a Ph.D. in 1920. He had majored in chemistry and physics.

During the World War, Mr. Teague was captain in the Chemical Warfare Service and assistant in charge of the Cannister Development Section of the Research Division. From 1919 to 1920 he was in charge of vehicular tunnel investigations at the Yale University Station of the Bureau of Standards.

He joined the United States Rubber Co. in 1920 as research chemist. In 1926, however, he was put in charge of the development and sales promotion of aqueous dispersions of rubber for the U. S. Rubber subsidiary, Naugatuck Chemical Co., a position he has capably held ever since. In 1929, he was also put in charge of development and sales of artificial aqueous dispersions of rubber for its associated company, Dispersions Process, Inc.

Mr. Teague is a member of the American Chemical Society.

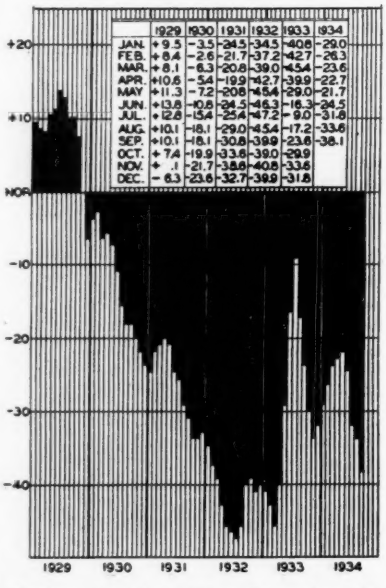
He lives at 35-47 80th St., Jackson Heights, L. I., N. Y.

**Peters Bros. Rubber Co., Inc.,** 160 John St., Brooklyn, N. Y., by developing a suitable technique now uses a heavier and more permanent layer of rubber in combining and thus avoids the fire hazard of petroleum solvents.

**Francis B. and Ronald O. Shaw,** directors of Francis Shaw & Co., Ltd., rubber and hydraulic engineer, Corbett St., Manchester, 11, England, recently visited the rubber trade in the United States.

**Hercules Powder Co.,** Wilmington, Del., announced that work will begin soon on a new plant at Parlin, N. J., for the manufacture of Tornesit, the company's new protective coating material. With the opening of this plant Tornesit will be produced in this country for the first time, replacing the material now imported from Germany.

M. C. Teague




Business Activity, 1929 to September, 1934

**F. E. Schundler & Co., Inc.,** 600 Railroad St., Joliet, Ill., producer and manufacturer of chemicals, including many for the rubber industry, for the past 5 years maintained an eastern plant in the Bush Terminal Bldg., Brooklyn, N. Y., but because of developments in grinding non-metallic minerals must increase production facilities. Consequently about November 1 the firm will move to 45-15 Vernon Ave., Long Island City, N. Y.

## Metal Exposition

The Sixteenth Annual National Metal Exposition and National Metal Congress was held in the Port of Authority Bldg., New York, N. Y., October 1 to 5, 1934. Although products containing rubber were naturally easily overlooked among the displays, rubber was nevertheless in evidence as the bonding constituent in several makes of grinding wheels for metal grinding service, also as insulation of electric cables for arc-welding.

Process cycle, temperature controllers, and tensile testing apparatus applicable to metallurgical operations and products were on display by the well-known concerns supplying similar facilities operating at lower physical ranges of capacity for standardization of rubber products. Thus the principal exhibiting concerns associated to a degree with the rubber industry were: Baldwin-Southwark Corp., Philadelphia, Pa.; The Bristol Co., Waterbury, Conn.; The Brown Instrument Co., Philadelphia; The Carborundum Co., Niagara Falls, N. Y.; E. I. du Pont de Nemours & Co., Inc., The R. & H. Chemicals Dept., Wilmington, Del.; The Grasselli Chemical Co., Inc., Cleveland, O.; Mears-Kane-Ofeldt, Inc., Philadelphia; The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.; The New Jersey Zinc Co., New York; Tinius Olsen Testing Machine Co., Philadelphia; The Shore Instrument & Mfg. Co., Jamaica, N. Y.; and C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

## Industrial Production

Business has been declining steadily and rapidly during the past 4 months. The advance which began last November continued until May of this year, during which period the index of production advanced 11 points. Since May the index has dropped about 16 points. The accompanying diagram shows the monthly changes in the volume of industrial production since the beginning of 1929. The index is based on the data of the Federal Reserve Board recomputed to show the percentages of deviation above and below the assumed normal level. The August figure is preliminary, and the September one is an estimate. These figures may be used to bring up to date any of the long diagrams of business changes published by the Cleveland Trust Co.

The most important factor in the decline during the summer months has

(*Continued on page* 64)

## MIDWEST

IN THE Midwest the rubber industry seems much busier generally than many other major industries. As farming communities abound in this section of the country, conditions are not exactly normal. The Government, however, is paying to the farmer certain sums of money, which policy may mean that more money will be in circulation than would have been otherwise. This state of affairs may have its effect in the purchasing power of the community later on. It is felt that business should show a distinct improvement no later than the middle of January, 1935. Movements toward any definite arrangements, Governmental or through industrially controlled codes, should produce a further feeling of stability which is bound to be reflected in increased business.

Although business in mechanicals shows no recent pick up, the current year's trade is greatly improved over last year's.

Rubber footwear manufacturers have not experienced any recent improvement in business, for business is entirely seasonal, and most orders were placed early. Many orders have already been shipped, with still others now going out. Little business is coming in daily. The industry is awaiting rubber footwear weather in the guise of rains and snow storms. Dealers' stocks are not considered heavy; consequently a good, normal winter will call for replenishment of stocks, to the benefit of the manufacturers, who now are making some goods in anticipation of such a call.

**G. W. Otter,** Chicago district representative of the Gates Rubber Co., Denver, Colo., moved his headquarters from 551 W. Lake St. to 549 W. Randolph St., Chicago, Ill.

**Van Cleef Bros.,** Chicago, Ill., manufacturer of Dutch Brand rubber and chemical products, will hold an annual sales conference at the Cleveland Hotel, Cleveland, O., November 19 to 23. Sales policies and products will be discussed, and sales plans made for 1935. The following will attend: Jack Ellison, Ralph A. Foster, F. J. Keller, M. H. Klinger, John W. Scott, H. D. Wexelberg, Herman Wronker, and Felix, Maxime, and Noah Van Cleef.

At the recent meeting of the National Safety Council in Cleveland a plaque was awarded to Van Cleef Bros. for the company's unusually high safety record of nearly 700 days with no lost time caused by accidents. This plaque was the second awarded the company; the former one was for 804 days without any lost time through accidents.

**Western Rubber Co.,** manufacturer of rubber for the industries, Goshen, Ind., recently held a special meeting of the directorate to fill the vacancy caused by the death of President George B. Slate. The present officers follow: Milton M. Latta, president and general manager; Ray Deahl, vice president; W. T. Stalter, treasurer and sales manager; and W. C. Latta, secretary and production manager.

**The Fourth Annual Industrial Research Conference,** sponsored by the Purdue Research Foundation, will convene at Purdue University, West Lafayette, Ind., November 23 and 24. This conference is essentially a symposium of the problems of industrialists and the activities of scientists. G. Stanley Meikle is secretary of the conference committee.

**The Leetex Rubber Products Co. (of Del.)** is now running its factory at 904 Blackhawk St., Chicago, Ill. Officers are L. D. Miller, president, and J. J. Lee, vice president. Both formerly were with The Barr Rubber Products Co., Sandusky, O. While the firm is specializing in liquid latex rubber balloons of all shapes and sizes, it also makes sponge rubber chair cushions, dog balls, mats, and mechanical hard rubber products.

## NEW JERSEY

MANUFACTURERS in New Jersey report good business in some lines, with no change in other products. Some goods have had prices slashed; while others have had theirs increased. Druggists' sundries and rubber tiling orders have gained. Rubber shoe manufacturers anticipate better business during the late fall.

Trenton rubber goods manufacturers will benefit considerably as a result of reduced freight rates on less than carload quantities of 10,000 pounds or more. The new freight charges affect hose, belting, jar rings, mats, tubing, imitation leather, and other products made in Trenton. All railroads east of the Mississippi have approved the new schedule. The reduction was the result of a conference between railroad officials and George E. Mace, traffic manager of the Trenton Chamber of Commerce.

Several local rubber manufacturers recently displayed their wares at the Trenton State Fair.

**The Thermoid Co.,** Trenton, has filed an application with the Securities and Exchange Commission, Washington, D. C., for registration of $1,416,168 in securities it proposes to issue. The concern is a holding company owning all outstanding stock of the Thermoid Rubber Co., Thermoid Textile Co., and the Woven Steel Hose & Rubber Co., and substantially all the outstanding stock of the Southern Asbestos Co. The issue for which registration is sought includes 84,240 shares of $1-par common stock estimated at $1,010,880, to be offered at an average price of $12 per share to noteholders on option; 53,792 shares of $1-par common stock to be offered to the public at market price of the common shares of the issuer on the New York Stock Exchange; and 7,458 shares of 7% cumulative convertible $100-par value preferred stock estimated at $223,740 to be offered at the market price of the issue on the New York Curb Exchange. Thermoid, long in need of additional power, is making improvements to its plant at a cost of $50,000. It is building a brick power house addition, 30 by 40 feet, and will install 2, 300 h.p. water tube boilers and Coxe automatic stokers. A 160-foot concrete chimney, 12 feet at the base, is also being constructed.

**Hamilton Rubber Mfg. Co.,** Trenton, through the Mercer County Board of Taxation received a reduction on real estate assessment of $235,000 to $195,000.

**La Favorite Rubber Mfg. Co.,** Paterson, manufacturer of hard and soft rubber packings, is represented by W. E. Williams. The concern's factory is at Hawthorne.

**Pierce-Roberts Rubber Co.,** Trenton, continuing with its night shift, expects a good fall season.

**Murray Rubber Co.,** Trenton, besides tires and tubes, now handles both batteries and spark plugs. They are manufactured for the company and bear its names. Murray officials declare they are meeting with success in the new innovation.

**The Pocono Co.,** Trenton, enjoying continued good business, with new orders from foreign lands, is operating overtime.

**Acme Rubber Mfg. Co.,** Trenton, has decreased some prices, while increasing others, a move made when the concern recently found certain products could be turned out more cheaply.

**William J. B. Stokes,** president of the Jos. Stokes Rubber Co., Trenton, is again confined to his home suffering from leg injuries received last winter when he fell on an icy pavement. He was able to get about this summer, but then complications developed.

**Puritan Rubber Co.,** Trenton, finds conditions much improved, with business good at this time.

**Mercer Rubber Co.,** Hamilton Square, reports that business is showing some improvement, with conditions better than during last fall. The concern has advanced prices on some of its products.

# Rubber Industry in Far East

## Malaya

As restriction really begins to get under way, the difficulties begin to crop up. On August 22, 1934, the Controller of Rubber issued a warning in which he stated that unless estates used their provisional credits on a much more generous scale than they had done in the past and dealers ceased to hold up rubber, it would become necessary to restrict the extent to which export credits may be carried forward and also to place limits on the stock which may be held by individual dealers, as has been done in Ceylon.

Under the International Agreement the maximum carry-over is limited to 12% of the permissible exports which, to the end of 1934, works out at 30,744 tons for Malaya, Labuan, and Brunei together. On this basis the Federated Malay States is allowed a carry-forward of 17,080 tons, but actually at the end of July this was 29,322 tons, or an excess of 12,242 tons. There is reason to believe that a similar state of affairs exists in Malaya as a whole.

Various explanations are offered for this lag of exports behind quotas. In certain sections it is suggested that many estates have been assessed too high; others whisper that dealers' stocks are in reality much lower than their books show; the shortage of labor is said to prevent many estates from filling their quotas, the labor situation being still unsatisfactory in several sections of the country, especially Johore; finally it is claimed that dealers and producers are holding back supplies in the hope of obtaining better prices. This last seems to be regarded by the Government as the true or main explanation, and since the warning does not appear to have had the desired effect, an amendment to the Rubber Regulation Enactment is being introduced in the Federal Council to deal with the situation.

It is first explained that by the terms of the International Agreement, if the total exports in a control year fall short of 88% of the permissible exports, export rights to an amount equal to the deficiency below 88% are irretrievably lost. The objects aimed at by the amendments are first to limit the extent to which dealers can occasion such a loss by holding up rubber and secondly to provide that the loss shall be distributed among those who caused it by their failure to exercise the export rights given them.

The amendments therefore provide that every licensed dealer who has in his possession or control on December 31, 1934, stocks of rubber exceeding a quantity equal to one-fourth of the total quantity of credits given him during the months of June, July, August, and September, 1934, shall be liable to a fine up to $1,000 (Straits currency), or to imprisonment for a maximum of 3 months, or both, and any excess of rubber shall be forfeited to the Government. The Controller is further enabled to cancel either wholly or partly all export credits standing in the name of any person other than a licensed dealer in the Customs Export Ledger or Controller's Ledger on December 31, 1934. Lastly any owner who fails to draw coupon in respect of his holding during the period for which such coupons are issuable shall lose all right to such coupons.

The proposed regulations are naturally the subject of much criticism. One writer protests that only Malayan producers who are not members of the Rubber Growers' Association will be affected. Members of the R.G.A., who comprise the majority of the companies, he explains, usually export their crops and can await a rise in price while their rubber is in storage outside of the F.M.S.; whereas private producers who do not export to Europe cannot adopt this policy, but must sell their crop each month.

## Netherland India

Various districts in Sumatra and Borneo have now been allotted various sums of money representing their respective shares in the proceeds of the special export duty on native rubber. Thus the Resident of South East Borneo received over half a million guilders to be devoted to useful public works. Most of Palembang's portion will be used to lighten taxation for the native population; while 10,000 guilders are intended to cover the cost of an experiment in restricting native exports by means of licenses.

Palembang, it is now known, has been hard hit by the export duty, which cut shipments the first half of August to 141 tons; for August, 1933, Palembang exports were 1,639 tons and for the month preceding the enforcement of restriction, 4,450 tons. The situation here is considered especially serious by the local Commerce Association because owing to present conditions in other crops the natives cannot turn to them with any hope of making a decent living; so widespread poverty is feared.

Another effect of restriction follows. Since the special export duty on native rubber has been divided into 2 groups, dry rubber and other rubber, the shipments of dry rubber from the Outer Possessions have steadily increased. The percentages of the total exports of native rubber from districts outside of Java, represented by dry rubber, rose from 17% in May to 29½% in June, 41½% in July, and 45% in August. Almost all rubber districts report increased imports of iron hand mangles, and the remilling factories here have been working to full capacity during recent months. If this rate of increase in dry shipments continues, Singapore remillers will be hard hit.

## Ceylon

A report on *Oidium* leaf disease in Ceylon in 1934, by R. K. S. Murray of the Rubber Research Scheme, reads that the attacks of this disease during the year were unusually severe even in the low country districts where climatic conditions have always been considered unfavorable to spore formation. For some years *Oidium* in Ceylon has caused serious defoliation at elevations of about 2,000 feet, sufficient in fact to threaten the economic existence of such areas if untreated. But so long as the disease was not severe at lower altitudes, it was comparatively unimportant for the rubber industry of Ceylon as a whole. In recent years, however, the disease has steadily increased in severity as well as extent so that it now also involves the whole area of mid-country rubber, elevations around 1,000 feet, and even some parts of low-country estates.

In the worst cases, at higher elevations, the fungus, active throughout the year, causes several abnormal defoliations each year, resulting in die-back of twigs and branches and a greatly decreased rate of bark renewal, with subsequent decline in yields. One case observed by the Research Scheme revealed an alarming drop in yield in a field which formerly gave very good outputs, and numerous reports of yield declines have been received from other estates. *Oidium* caused little damage in low-country districts until 1934 when for the first time occurred marked denudation of leaves, and several cases of retarded bark renewal and declines in yield have been reported. Furthermore the attack, instead of subsiding after 6 to 8 weeks as in previous years, continued almost twice that time. It is held that this increased activity of the fungus is not wholly attributable to weather conditions, and the prolonged attack particularly suggests a process of acclimatization so that there is a possibility of the disease becoming increasingly severe also in low country. Since the matter is still doubtful, however, a wait-and-see policy is advocated with regard to checking the disease in low country, but for mid-country estates regular dusting with sulphur is held essential. This policy

(*Continued on page* 64)

# Rubber Industry in Europe

## GREAT BRITAIN

### Rubber Powder from Latex

The Rubber Powder Co., Ltd., gives interesting details regarding the progress made in producing rubber powder from latex. A machine, constructed for the purpose in Amsterdam, Holland, was sent to a Ceylon estate in April; production commenced at the end of May; and the first shipments of rubber powder have already reached London. The powder received from the Far East is said to be very much better than that made in Amsterdam from imported preserved latex. Although shipped in ordinary packing cases lined with paper and not hermetically sealed, the powder arrived in good condition. Rubber powder, it may be added, seems more economical to pack than the usual forms of crude rubber: 50 pounds of powder are packed in the space of one cubic foot against 45 pounds of sheet and only 34 pounds of crepe.

The new material has already been used experimentally by certain English rubber manufacturers, apparently with satisfactory results, and further tests are to be carried out by other manufacturers.

An improved machine capable of turning out 350 to 400 pounds of rubber powder per hour, now being built, will be sent to Ceylon after being tested here. Before long it is expected to be able to deliver a machine a week. The directors of the Rubber Powder Co. feel that with the results obtained so far and the progress already made the time is at hand when more ambitious plans may be considered; so the question of obtaining additional capital to further these is receiving attention.

### Road Trains

A new era of motor transportation in the more inaccessible parts of the British Empire has been inaugurated by the development of the so-called road train, according to a report of the Oversea Mechanical Transport Directing Committee. To this committee, which is financed partly by 23 overseas governments and partly by the Empire Marketing Board, was given the task of devising suitable means of transporting heavy loads on dirt or lightly constructed roads, cheaply and with as little damage to the roads as possible. The road train is the result. It consists of an 8-wheeled drive tractor with 8-wheeled trailers, the whole being equipped with specially designed 10½-inch Dunlop low pressure tires. After severe tests on unmetaled roads and tracks in England, one such train was shipped to the Gold Coast, where its success led to its purchase by the local government. Another, sent to Australia, has run thousands of miles in the last 5 months, transporting great loads of building materials, cement, local produce, etc., over the less developed stretches in Central Australia.

### New Rubber Road

A 70-yard section of road in front of the Leyland & Birmingham Rubber Co. is being paved with rubber blocks by the Urban District Council of Leyland to test the value of rubber roads in lessening traffic noises, reports the London *Rubber Age*. The blocks, supplied by the Leyland rubber company, are laid on 3 inches of tarmac on a rubble foundation sealed with bitumen. The bottom of each block is dipped in bitumen as it is laid, and the bricks are arranged diagonally so as to leave a ¼-inch space between the rows of bricks, which is subsequently sealed with bitumen. The diagonal arrangement of the blocks, it seems, results in better distribution of the strain of traffic; while the bitumen sealed spaces are said to help give a certain flexibility to the paving which prevents buckling under traffic pressure.

### British Notes

It is now possible to buy a Japanese cycle tire in England for 6d.

The Litherland factory of the Northwestern Co. was partly destroyed by fire, and production was temporarily cut in half. However the new machinery rapidly being installed, together with the improved processes developed under M. H. MacKusick, are expected soon to permit full production again.

Following the example of the rubber proofers, over 40 leading waterproof garment manufacturers in Manchester have formed an association to improve conditions in the trade and will cooperate with the Proofer's Association. The aim will be not only to prevent underselling, but to improve labor conditions and to raise the quality of the product, particularly as to fabric and dyes.

Malcolm Irving, general manager for Dunlop in South Africa, arrived in England in connection with the new Dunlop factory which is being built in Durban. This factory, which will open before the year-end, will produce tires and other rubber goods and will be the first of its kind in South Africa, it is said. Outside of the English "key" men, the employes will all be South Africans.

Universal Rubber Paviors, Ltd., for the past business year reported a profit of £3,410 against a loss of £899 the year before. The debit balance is now £22,170.

Pirelli, Ltd., is adding 21 bays to its factory at Burton-on-Trent.

### Irish Free State

The Dunlop Rubber Co., Ltd., has made an agreement with the Irish Free State with regard to the manufacture of tires and tubes there. According to this arrangement, which, it seems, is for 15 years, the government, having granted the company a license permitting manufacture, undertakes to protect the concern by restricting imports. On its side Dunlop has agreed to sell its products at figures calculated according to a certain formula. For the present tire prices will be not more than 15% above the corresponding price in Great Britain; hitherto tires in the Free State have been about 30% higher than in England. Dunlop soon will start production in the City of Cork.

Two orders prohibiting the importation of tires into the Irish Free State except under license went into effect September 1, 1934. Importers have been registered, and quota periods fixed. For the period October 1, 1934, to December 31, 1934, the quota for tires for mechanically propelled vehicles other than bicycles or tricycles has been fixed at 36,000 and for cycle tires, at 160,000.

Under a later Control of Imports Order, effective September 19, 1934, footwear, wholly or partly of rubber, may not be imported without license.

### Germany

In an article[1] on the use of artificial masses in the construction of chemical apparatus Kurt Haupt discusses the progress made in Germany in the application of rubber and latex for these purposes, referring among others to the so-called Keraplast Process. In this process, it seems, certain mineral substances are bound with concentrated latex to form a material of the consistency of soft rubber, which is said to have a high degree of elasticity, chemical resistance, imperviousness to fluids, and unusual adhesive strength. One of its uses is in a new method of constructing containers in which the iron frames are covered with wire netting, perforated metal sheets, or the like, and these in turn are covered with the Keraplast mass. Keraplast further serves as elastic bonding material in fixing ceramic tiles in lining vessels; for the manufacture of protective

[1] *Kunststoffe*, Sept., 1934, pp. 217-20.

floor-coverings as well as for attaching floor covers and filling the seams.

Mr. Haupt next describes the use of latex in making elastic and flexible filtering stones for filter-presses, etc., when a material is produced having the properties of both the porous filtering mass and rubber. Small units of filtering stones may be cemented together with latex or a granular material or may be coated with a thin film of latex and the individual grains more or less closely connected by vulcanization.

In Germany the art of covering apparatus of the most varying types with thin unvulcanized rubber sheet has been developed to a high degree of perfection, it seems, and at the Achema VII, recently held in Cologne, the Rheinische Gummiwaren A.G. Franz Clouth, Koln-Nippes, showed different apparatus for the dyeing industry, a silk winder, and centrifuges and pumps, all completely covered with Durabilit rubber coating. The Harzer Achsenwerke G.m.b.H., Bornum a. Harz, on the same occasion showed a heatable autoclave with capacity of 2,000 liters, which had a thin rubber lining and could be used with complete assurance for operations in which hydrochloric acid was used at 140° and corresponding pressure.

Mention may also be made of Continental's rubber-lined vessels of wood and iron and of the wire sieves coated with hard or soft rubber produced by another firm. Hard rubber objects are, of course, well known. In recent years microporous rubber made of latex according to the Beckmann process has been finding extended use for filters, separators, diaphragms, etc., as produced by Dartex A.G., Frankfurt a.M.

The Goodyear Tire & Rubber Co. A.G., Berlin, reduced its capital by 440,000 marks to 310,000 marks. Edward William and Milton S. Meyer are no longer directors, and Crittenden Churchill Crittenden, of Berlin, is now on the board.

The firm of Klentze & Co., G.m.b.H., Hamburg, has been converted into a limited partnership, Klentze & Co. L. W. Klentze is the personally responsible partner. Business, however, will be continued as formerly, for all home and foreign connections are being retained unchanged.

The asbestos industry now too is under government control. As in the case of rubber and other controlled materials, manufacturers and dealers must register and make a statement regarding their stocks, requirements, financial obligations, etc.

A new material introduced in Germany under the trade name Krutex is a mixture of rubber and cork, said to possess the advantages of both materials. Although the proportion of rubber, which is used as a binding medium, is quite high, panels of this material will not bulge out sideways when used as sub-layers or insulation. The specific weight is somewhat smaller than in the case of rubber. Krutex is produced in boards, from 0.8 to 12.7 millimeters thick.

## Austria

The rubber industry in Austria consists mainly of one company, Semperit-Reithoffer, with 3 plants at Wimpassing, Vienna, and Traiskerchen. They are now reported to be employing about 5,000 workers. The company also operates plants in Czechoslovakia, Yugoslavia, and Poland. It is reliably estimated that slightly more than 50% of Austrian rubber goods production is exported, chiefly to England. Production statistics are not available, but tire output for 1934 is estimated at 100,000 casings, 110,000 inner tubes, and 3,000 solids, of which only about 3% is exported. Imported tires account for about 18% of domestic sales, a third of these imports coming from France, a third from England, a sixth from the United States, and a sixth from other countries. The slump in tire imports which occurred in 1933 has been arrested, and British and American tires have increased slightly their share of the imports; while French tires lost slightly, and German tires drastically, during the first half of 1934. Imports from the United States included $26,000 worth of tires and $24,000 worth of other rubber goods.

Austrian imports of crude rubber, scrap rubber, and gutta percha increased 48% in quantity and 62% in unit value or price in the first half of 1934, compared with 1933. Imports of rubber products increased 2.7% in quantity and on the average show a price advance of 6.2%. Exports of rubber products from Austria increased 28% in quantity and show an average price advance of 7.3%, compared with the first half of 1933.

Austrian trade statistics show an export surplus on foreign trade in rubber and rubber products, exports being valued at 8,607,000 schillings, and total imports at 6,069,000 schillings in the first half of 1934. Exports of rubber goods are distributed through European countries; imports come chiefly from England, Germany, and France; and 90% of the rubber imports come directly from British and Dutch possessions in the Middle East.

Several mergers completed in 1933 have enabled this Austrian industry to hold its own in the domestic field as well as meet competition abroad. The industry claims it lacks sufficient tariff protection and at the same time protests continued endeavors of neighbors to shut off imports by customs barriers and currency restrictions. Exports to Western European countries are said to have been conducted at a loss; while those to overseas markets are greatly hampered by exchange restrictions. Although Austrian tariff rates have been unchanged since 1924, sales and crisis taxes and exchange restrictions have operated against imports, and there have been import restrictions on some articles, the net result being increased domestic production especially in rubberized fabrics, squeaking dolls, toy balloons, and rubber thread.

Among the exports are worth noting rubber thread, 381 against 288 quintals; footwear, 578 against 574 quintals; packing, 2,324 against 2,080 quintals; hose, 2,134 against 2,125 quintals; belting, 399 against 180 quintals; soft rubber goods, 3,571 against 2,097 quintals; hard rubber and manufactures, 1,096 against 811 quintals; rubberized fabrics, 785 against 544 quintals. Exports of bathing caps took a notable spurt, from 435,808 to 851,919 pieces. A large part of these caps went to England. Among the few export items that declined were automobile casings, 591 against 644 quintals, and toys, 1,228 against 1,288 quintals. The export trade in rubber toys has been steadily declining during the last few years.

Austria's main imports included outside of crude rubber, 1,852, against 1,724, quintals of automobile tires; rubberized fabrics, 523 against 364 quintals; and rubber thread, 410 against 470 quintals.

The Dunlop Co. and the Hungarian Group Julius Klein are reported to have jointly acquired 15% of the shares of the Ungarische Gummi A.G., from the Kreditanstalt Bankverein in Vienna.

## Czechoslovakia

Probably the oldest rubber factory in Czechoslovakia is the Matador Gummiwerke A.G., established in 1905 at Prague, which manufactures automobile tires, solid tires, floor coverings, all kinds of balls, etc. The Viktoria Gummi-industrie A.G., Brunn, dates to 1921 and makes chiefly cycle tires, covers for mechanical and surgical goods, sponge rubber goods, and floor coverings. The Optimit Gummi-und Textil Werke A.G., Prague, was established in 1922 chiefly to produce rubberized fabrics. Continental has a branch in Prague, Continental Caoutchouc A.G., to make and sell rubber goods and automobile accessories; while the Goodyear company has a sales branch for its tires and other rubber goods, known as Goodyear Rubber Vertriebs A.G., Prague, formed in 1932.

In 1933 Czechoslovakia imported 11,219 tons of crude rubber, reexporting 668 tons. The chief manufactured rubber goods imported that year included 99,017 cycle tubes, 61,906 tires, 45,861 other tubes, and 85,531 other tires.

## European Notes

Caoutchouc de l'Oise, with headquarters in Paris, has just been formed with a capital of 7,200,000 francs to manufacture pneumatic tires.

The Roumanian rubber factory known as Cauciucul, recently established at Bucharest, has now started operations and will produce galoshes and snowshoes besides other rubber goods.

The Skandinavisk Pepege A.S., Copenhagen, Denmark, sales branch of the Polish firm of this name, is in liquidation

# Patents and Trade Marks

## MACHINERY

### United States

1,971,334. **Gasket Applying Mechanism.** C. J. Aulbach, Syracuse, assignor to Continental Can Co., Inc., New York, both in N. Y.

1,971,445. **Elastic Thread Apparatus.** W. A. Gibbons, Montclair, N. J., assignor to Revere Rubber Co., Providence, R. I.

1,971,453. **Thread Tension Device.** G. Horn, Berlin-Weissensee, Germany.

1,971,582. **Tire Groover.** H. F. Scruby, Beverly Hills, Calif.

1,971,667. **Sheet Rubber Ornamenter.** W. R. Weeks, Hamden, assignor to Seamless Rubber Co., Inc., New Haven, both in Conn.

1,971,849. **Molding Apparatus.** J. W. Brundage, assignor to Summit Mold & Machine Co., both of Akron, O.

1,971,850. **Press.** W. Ernst, assignor to Hydraulic Press Mfg. Co., both of Mt. Gilead, O.

1,972,457. **Latex Spreader.** R. J. O'Brien, Rutherford, and F. R. Chappell, Passaic, both in N. J., assignors to Naugatuck Chemical Co., Naugatuck, Conn.

1,972,816. **Bagless Tire Curing Mold.** S. G. Back, assignor of ¼ to A. H. Rohleder, both of Ashland, O.

1,972,822. **Rubber Composition Treater.** R. D. Wilhelm and E. E. Bevan, both of South Gate, Calif., assignors to Firestone Tire & Rubber Co., Akron, O.

1,972,824. **Strand Coater.** G. W. Danielson, Fall River, Mass., assignor to Firestone Tire & Rubber Co., Akron, O.

1,973,059. **Plastic Material Shrinking Device.** R. H. Gerke, Nutley, N. J., assignor to Morgan & Wright, Detroit, Mich.

1,973,333. **Hardness Tester.** P. Craemer, Herzebrock, Germany.

1,974,021. **Tire Tool.** M. A. Gibson, Alliance, Neb.

1,974,185. **Golf Ball Cleaner.** O. E. Heisser, Chicago, Ill.

1,974,209. **Plastic Article Former.** F. D. Fowler, Newton, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.

1,974,210. **Fabric Smoother and Guider.** F. D. Fowler, Newton, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.

1,974,212. **Ball Winder.** J. R. Gammeter, Akron, O., assignor, by mesne assignments, to B. F. Goodrich Co., a corporation of N. Y.

1,974,219. **Plastic Article Machine.** McC. Shank, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

### Dominion of Canada

344,344. **Retreading Vulcanizer.** C. E. Miller, Anderson, Ind., U. S. A.

344,421. **Weftless Cord Fabric Apparatus.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of B. H. Foster, Maplewood, N. J., U. S. A.

344,565. **Liquid Concentrator.** Dunlop Rubber Co., Ltd., London, assignee of D. F. Twiss and E. A. Murphy, co-inventors, both of Birmingham, all in England.

344,734. **Rubber Article Apparatus.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of C. R. Peaker, Waterbury, Conn., and E. Hazell, New York, N. Y., co-inventors.

344,735. **Adhesive Applier.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of R. J. O'Brien, Rutherford, N. J., and E. Hazell, New York, N. Y., co-inventors, both in the U. S. A.

### United Kingdom

409,214. **Latex Thread Apparatus.** R. F. McKay, Birmingham. (International Latex Processes, Ltd., St. Peter's Port, Channel Islands.)

410,058. **Footwear Welting Extruder.** H. G. Halloran, Milton, Mass., U. S. A.

410,415. **Latex Thread Apparatus.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands.

410,682. **Calender.** A. Pratt, Bearsden, Scotland.

410,688. **Tire Mold.** H. Thorburn, Toronto, Canada.

410,690. **Watchcase Vulcanizer.** Firestone Tyre & Rubber Co., Ltd., Brentford. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

410,984. **Tire Mold.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

411,169. **Boot Vulcanizer.** V. C. Wilde, Rhos-on-Sea; T. Halsall, Middleton; and J. Prior, Rochdale.

411,472. **Cement Applying Tool.** J. R. L. Allott, Stoke-on-Trent, and O. H. Buth, Birkenhead.

### Germany

601,895. **Apparatus to Separate Bias-Cut Strips.** Dunlop Rubber Co., Ltd., London, England. Represented by B. Kaiser and E. Salzer, both of Frankfurt a.M.

602,349. **Remover of Vulcanized Golf Balls, Etc., from Sectional Molds.** E. Skelton and E. St. Long, both of London, England. Represented by W. Schmitzdorff, Berlin.

602,395. **Repairer of Defects in Insulations of Conductors.** Hackethal-Draht & Kabel-Werke A.G., Hannover.

602,406. **Comb Cutter.** C. Tober, Berlin-Karlshorst.

602,461. **Apparatus to Make Thread from Rubber Dispersions.** Dunlop Rubber Co., Ltd., London, England, and Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands. Represented by C. and E. Wiegand, both of Berlin.

602,677. **Apparatus to Make Rubber Soled Shoes.** Rollmann & Mayer A.G., Koln-Nippes.

603,355. **Apparatus to Make Seamless Hollow Goods.** Kaysam Syndicate, Ltd., London, England. Represented by G. Lotterhos, Frankfurt a.M., and M. Eule, Berlin.

## PROCESS

### United States

19,293 (Reissue). **Pile Faced Material.** F. W. Moore, E. Orange, N. J.

1,972,503. **Variegated Articles.** R. E. Walker, assignor to Quabaug Rubber Co., both of N. Brookfield, Mass.

1,972,976. **Lined Rubber Footwear.** L. H. Burnham, Lexington, and R. M. Holden, Worcester; said Burnham assignor to Hood Rubber Co., Inc., Watertown, and said Holden assignor to Holden Knitting Co., Worcester, all in Mass.

1,973,748. **Sole.** J. R. Caldwell, Akron, O.

1,973,904. **Sponge Rubber Coated Fabric.** T. M. Knowland, Watertown, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass.

1,974,203. **Cap.** A. E. Collins, Cuyahoga Falls, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,974,211. **Hose.** L. M. Freeman and H. W. Catt, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

1,974,261. **Method of Using Latex.** J. W. Clarke and J. H. Grady, assignors to J. H. Grady Mfg. Co., all of St. Louis, Mo.

1,974,285. **Hose.** A. D. Maclachlan, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

### Dominion of Canada

344,746. **Rubber Coated Steel Object.** National-Standard Co., assignee of E. C. Domm, both of Niles, Mich.

### United Kingdom

409,311. **Ball.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and G. W. Trobridge, E. A. Murphy, and A. S. King, all of Birmingham.

409,388. **Compound Sheet Material.** C. K. Bamber, London.

409,421. **Microporous Rubber.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and E. W. Madge, Birmingham.

409,520. **Coated Fabric.** J. Pennel and J. Flipo, (trading as Soc. J. Pennel & J. Flipo), both of Roubaix, France.

409,581. **Weftless Cord Fabric.** R. F. McKay, Birmingham. (International Latex Processes, Ltd., St. Peter's Port, Channel Islands.)

409,641. **Smoked Sheet.** F. H. Faithfull, Tapah, Perak, F. M. S.

409,793. **Road.** St. Albans Rubber Co., Ltd., London, and J. D. Campbell, St. Albans.

409,900. **Rubber Thread.** Xetal Corp., New York, N. Y., assignee of F. Cremer, Englewood, N. J., both in the U. S. A.

409,941. **Heel Counter Stiffener.** Soc. D'Etudes De Brevets, Luxemburg, Luxemburg, assignee of M. Jack, Tallinn, Esthonia.

410,006. **Goods from Aqueous Dispersions.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of Soc. Italiana Pirelli, Milan, Italy.

410,116. **Hose Pipe.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.

410,194. **Hollow Cylinder.** Flakice Corp., Wilmington, Del., assignee of C. Field, Brooklyn, N. Y., both in the U. S. A.

410,271. **Compound Fabric.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and E. W. Madge and F. J. Payne, both of Birmingham.

410,285. **Coated Fabric.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, and G. W. Trobridge, Birmingham.

410,311. **Connecting Rubber to Canvas.** Magyar Ruggyantaarugyar Reszvenytarsasag and I. and L. Dorogi, all of Budapest, Hungary.

410,439. **Mat.** Redfern's Rubber Works, Ltd., and J. A. Redfern, both of Hyde.

410,847. **Labeling Bathing Caps.** Magyar Ruggyantaarugyar Reszvenytarsasag and Z. De Jarmay, both of Budapest, Hungary.

410,875. **Granular Rubber.** Rubber Growers' Association, Inc., G. Martin, W. S. Davey, and J. E. Townley, all of London.

411,032. **Artificial Silk Filter.** Kaysam Syndicate, Ltd., London.

411,202. **Cellular Rubber.** Soc. Italiana Pirelli and U. Pestalozza, both of Milan, Italy.

411,331. **Diaphragm.** R. F. McKay, Birmingham. (International Latex Processes, Ltd., St. Peter's Port, Channel Islands.)

411,334. **Mat.** Septa Soc. Anon., Luxemburg, Luxemburg.

411,460. **Treating Textiles with Rubber.** Filastic, Ltd., London. (J. E. C. Bongrand, Paris, and L. S. M. Lejeune, Nord, both in France.)

411,586. **Stamp-Welding Bathing Caps.** Magyar Ruggyantaarugyar Reszvenytarsasag, assignee of Dr. Dorogi Es Tarsa Gummigyar R. T., and I. and L. Dorogi, all of Budapest, Hungary.

411,937. **Power Transmitting Disk.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.

### Germany

602,266. **Rubber Insulated Electric Conductors.** Hackethal - Draht & Kabel-Werke A.G., Hannover.

602,348. **Decorating Hollow Rubber Balls.** Harburger Gummiwaren-Fabrik Phoenix A.G., Harburg-Wilhelmsburg.

602,462. **Seamless, Hollow Dipped Goods.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands. Represented by C. Wiegand, Berlin.

602,691. **Coloring Rubber and Rubber-like Masses.** I. G. Farbenindustrie A.G., Frankfurt a.M.

## CHEMICAL

### United States

1,971,522. **Adhesive.** H. V. Dunham, Bainbridge, N. Y.

1,971,746. **Preparing Rubber.** M. T. Flaxman, assignor to Union Oil Co. of California, both of Los Angeles, Calif.

1,972,918. **Accelerator.** H. M. Bunbury, Prestwich, J. S. H. Davies, Crumpsall, W. J. S. Naunton, Prestwich, and R. Robinson, Oxford, all in England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

1,972,961. **Disinfectant.** W. H. Tisdale and I. Williams, assignors to E. I. du Pont de Nemours & Co., all of Wilmington, Del.

1,972,963. **Accelerator.** I. Williams, Woodstown, N. J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,973,000. **Synthetic Rubber.** E. Konrad, Leverkusen, and E. Tschunkur, Cologne-Mulheim, assignors to I. G. Farbenindustrie A. G., Frankfurt a. M., all in Germany.

1,973,398. **Age Resister.** E. W. Trolander and W. C. Wilson, assignors to Pyroxylin Products, Inc., all of Chicago, Ill.

1,973,914. **Accelerator.** G. H. Stevens, Newark, N. J.

1,973,918. **Accelerator.** D. H. Tompkins, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

### Dominion of Canada

344,246. **Latex Coating.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of C. E. Linscott, Saugus, Mass., U. S. A.

344,381. **Reclaiming Rubber Goods.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of F. D. Chittenden, Nutley, N. J., U. S. A.

344,382, 344,383, 344,384, 344,385, 344,386, 344,387, 344,388, 344,389, 344,390, 344,391, 344,392, 344,393, 344,394, 344,395, and 344,396. **Accelerator.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. P. ter Horst, Akron, O., U. S. A.

344,420. **Latex Rubber Film.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of P. H. Watkins, Naugatuck, Conn., U. S. A.

344,494 **Coloring Rubber Surfaces.** W. C. Geer, Ithaca, N. Y., U. S. A.

344,603. **Accelerator.** Rubber Service Laboratories Co., Akron, O., assignee of J. R. Ingram, Nitro, W. Va., both in the U. S. A.

344,763. **Rubber and Leather Processing.** Rubber Service Laboratories Co., Akron, O., assignee of R. L. Sibley, Nitro, W. Va., both in the U. S. A.

344,764. **Diphenyl Derivative Preparation.** Rubber Service Laboratories Co., Akron, O., assignee of R. L. Sibley, Nitro, W. Va., both in the U. S. A.

### United Kingdom

409,151. **Conductor Insulation.** R. F. McKay, Birmingham. (International Latex Processes, Ltd., St. Peter's Port, Channel Islands.)

409,294 and 409,295. **Porous Fibrous Rubber Composition.** Vol Crepe, Ltd., P. Barton, P. S. M. Reid, and A. E. Salmon, all of Glossop.

409,434. **Golf Ball Shell Treatment.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss, F. A. Jones, and E. W. Allen, all of Birmingham.

409,542. **Rubber Composition.** P. Meyersberg and G. Wolf, both of Bratislava, Czechoslovakia.

409,680. **Fireproofing Sponge Rubber.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss, A. S. Carpenter, and A. E. T. Neale, all of Birmingham.

409,772. **Golf Ball Surface Treatment.** W. C. Geer, Ithaca, N. Y., assignee of J. W. Baymiller, Springfield, Mass., both in the U. S. A.

409,891. **Rubber Composition.** H. W. Cowling, Redhill.

409,971. **Age Resister.** J. R. Geigy A. G., Basle, Switzerland.

410,132. **Aqueous Dispersion.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)

410,171. **Golf Ball Surface Treatment.** W. C. Geer, Ithaca, N. Y., U. S. A.

410,249 and 410,270. **Chlorinated Rubber.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and J. A. Wilson, both of Birmingham.

410,274. **Age Resister.** B. F. Goodrich Co., New York, N. Y., assignee of D. Craig, Akron, O., both in the U. S. A.

410,436. **Surface Hardening Golf Balls.** Dunlop Rubber Co., Ltd., London, and D. F. Twiss and F. A. Jones, both of Birmingham.

410,454. **Accelerator.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of C. Coleman, Passaic, N. J., both in the U. S. A.

410,500. **Accelerator.** E. I. du Pont de Nemours & Co. and C. H. Greenewalt, both of Wilmington, Del., U. S. A.

410,541. **Cold Vulcanization.** E. R. Sutcliffe, Newton-le-Willows, and W. E. Edwards, Leigh.

410,563. **Road Surfacing Composition.** G. E. Heyl, London.

410,793 and 410,794. **Rubber Composition.** Dunlop Rubber Co., Ltd., London; Anode Rubber Co., Ltd., St. Peter's Port, Channel Islands; and E. A. Murphy, Birmingham.

411,265. **Fibrous Composition.** G. E. Heyl, London.

411,478. **Stabilizing Latex.** Imperial Chemical Industries, Ltd., London, and H. M. Bunbury and R. B. F. F. Clarke, both of Manchester.

411,640. **Bituminous Composition.** J. R. Geigy A. G., Basle, Switzerland.

411,871. **Latex.** J. W. Battersby, Edgware.

411,893 and 411,894. **Hydrocarbon.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfurt a. M., Germany.)

## GENERAL

### United States

19,322. (Reissue). **Refrigerator Tray.** C. H. Tanger, deceased, late of Evansville, Ind., by Servel, Inc., New York, N. Y.

1,971,327. **Dual Pneumatic Wheel.** F. W. Burger, Niles, assignor to Clark Equipment Co., Buchanan, Mich.

1,971,345. **Syringe.** G. N. Hein, San Francisco, Calif.

1,971,404. **Sash Guide.** W. S. Hamm, Elkhart, Ind., assignor to Adlake Co., Chicago, Ill.

1,971,417. **Motor Support.** F. S. Kingston and B. L. Conley, both of Warren, O.; said Kingston assignor, by mesne assignments, to General Motors Corp., Detroit, Mich.

1,971,439. **Printer's Blanket.** F. G. Arnold, assignor to Rapid Roller Co., both of Chicago, Ill.

1,971,456. **Footwear.** H. P. Manville, New Haven, assignor to Goodyear's India Rubber Glove Mfg. Co., Naugatuck, both in Conn.

1,971,467. **Milking Machine Teat Cup.** W. A. Scott, Poughkeepsie, assignor to De Laval Separator Co., New York, both in N. Y.

1,971,530. **Valve Grinding Tool.** H. W. Kulp and M. C. Dellinger, assignors to K-D Mfg. Co., all of Lancaster, Pa.

1,971,545. **Toy Block.** E. E. Tompkins, Haverford, assignor to Rubber Specialties Co., Inc., Conshohocken, both in Pa.

1,971,630. **Electric Hearing Apparatus for the Deaf.** A. von Suchorzynski, Breslau-Bischofswalde, Germany.

1,971,653. **Expansible Wheel.** J. Levoy, Berkeley, and A. H. Green, San Francisco, both in Calif.

1,971,671. **Diaper Holder.** B. S. Alsop, New York, N. Y.

1,971,676. **Automobile Shackle Shock Absorber.** A. J. Borst, Jr., Buffalo, N. Y.

1,971,788. **Bathing Cap Head Band.** F. C. Lampe, Brooklyn, N. Y.

1,971,893. **Windshield Wiper.** J. W. Anderson, Gary, Ind.

1,972,076. **Ventilating Device.** G. C. Cross, Watervliet, Mich.

1,972,080. **Truss.** H. A. French, Charlestown, N. H.

1,972,114. **Force Cup.** W. B. Stephenson, Chicago, assignor of ½ to G. J. Irsch, Harvey, both in Ill.

1,972,145. **Woodworking Machine.** G. T. Johnson, assignor to Yates-American Machine Co., both of Beloit, Wis.

1,972,150. **Spindle.** F. G. Kraft, Richmond, Va., assignor to Du Pont Rayon Co., New York, N. Y.

1,972,167. **Syringe.** O. O. R. Schwidetzky, Hasbrouck Heights, assignor to Becton Dickinson & Co., Rutherford, both in N. J.

1,972,235. **Brake Member.** R. J. Norton, Washington, D. C., assignor to Bendix Brake Co., S. Bend, Ind.

1,972,275. **Athletic Protector.** F. M. Record, Beverly Hills, assignor of ½ to G. Travers, Los Angeles, both in Calif.

1,972,375. **Calf Feeding Pail.** J. McK. Coyner, Madison, Wis.

1,972,382. **Furnisher Brush.** W. H. Heffernan, assignor to Heffernan Brush Co., Inc., both of N. Adams, Mass.

1,972,481. **Cap Mounting Means.** J. A. Gray, Oakland, Calif.

1,972,566. **Meat Saw.** C. A. Laemmel, assignor to Atlantic Service Co., Inc., both of Brooklyn, N. Y.

1,972,678. **Rail Vehicle Guide Flange.** P. M. Bourdon, Paris, assignor to Michelin & Cie., Clermont-Ferrand, both in France.

1,972,755 and 1,972,756. **Laminated Article.** S. B. Blaisdell, Wyncote, Pa., assignor to Fidelity Machine Co., Wilmington, Del.

1,972,770. **Wheel.** J. E. Gillespie, Lincoln, Neb.

1,972,809. **Packing Structure.** J. W. Watson, Wayne, and R. F. Nowalk, Philadelphia; said Nowalk assignor to John Warren Watson Co., Philadelphia, all in Pa.

1,972,820. **Pneumatic Tire.** C. D. Smith, Fairlawn, assignor to Firestone Tire & Rubber Co., Akron, both in O.

1,972,825. **Resilient Rail Support.** W. H. Funston, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,972,843. **Sole.** D. C. Hubbard, Auburn, assignor to Webster Rubber Co., Sabattus, both in Me.

1,972,895. **Feeding Device.** F. Maccoy, Detroit, Mich.

1,972,909. **Inflatable Ball.** A. J. Turner, assignor to Wilson-Western Sporting Goods Co., both of Chicago, Ill.

1,972,953. **Rubber Stamp.** A. J. Reynolds, Tampa, Fla.

1,973,041. **Drag Conveyer and Belt.** P. J. Birkmeyer, Brooklyn, assignor to Western Union Telegraph Co., New York, both in N. Y.

1,973,077. **Heel.** C. H. Ingwer, assignor to I. T. S. Co., both of Elyria, O.

1,973,105. **Shoe.** C. F. Rohn, Whitefish Bay, and F. A. Rohn, Milwaukee, both in Wis.

1,973,124. **Airplane Structure.** H. Swan, Upper Montclair, and S. Higgins, Verona, both in N. J., assignors to Bakelite Corp., New York, N. Y.

1,973,160. **Mattress Bedpan Equipment.** H. J. Wagner, Troy, N. Y.

1,973,178. **Theater Chair.** O. F. Sass, assignor to Interior Hardwood Co., Ltd., both of Kitchener, Ont., Canada.

1,973,207. **Golf Driving Mechanism.** H. E. Hellum and J. P. Glish, both of St. Paul, Minn.; said Glish assignor to said Hellum.

1,973,214. **Hinged Connection.** F. H. Lamb, Hoquiam, Wash.

1,973,267. **Motor Vehicle Propelled Railroad Car.** W. W. Rabey, Long Lake, S. D.

1,973,292. **Footwear.** N. Littell and H. C. Hebig, both of Brooklyn, N. Y.

1,973,318. **Strip Photographic Camera.** E. E. Lee, Los Angeles, Calif.

1,973,366. **Windshield Wiper.** J. W. Anderson, Gary, Ind.

1,973,481. **Wiper Carrying Arm.** E. C. Horton, Hamburg, and H. Hueber, Buffalo, assignors to Trico Products Corp., Buffalo, all in N. Y.

1,973,584. **Raft.** J. W. Tatter, Detroit, and G. B. Ingersoll, Dearborn; said Ingersoll assignor to E. I. Ingersoll, Dearborn, all in Mich.

1,973,594. **Hat.** J. N. Wolf, assignor to Schoble Hats, Inc., both of Philadelphia, Pa.

1,973,646. **Belt.** E. S. Mix, assignor to Hickok Mfg. Co., Inc., both of Rochester, N. Y.

1,973,690. **Calender Roll.** A. Lade, Northampton, Mass.

1,973,799. **Valve Cap.** J. C. Crowley, Cleveland Heights, assignor to Dill Mfg. Co., Cleveland, both in O.

1,973,845. **Fountain Syringe.** J. S. Chenoweth, Louisville, Ky.

1,973,849. **Garment.** M. S. Erlanger, assignor to B. V. D. Co., Inc., both of New York, N. Y.

1,974,009. **Twin Tire Load Balancer.** P. M. Bourdon, Paris, assignor to Michelin & Cie., Clermont-Ferrand, both in France.

1,974,027. **Farm Implement.** E. O. Knick, Iowa City, Iowa.

1,974,161. **Arch Support.** W. J. Riley, Belmont, Mass.

1,974,237. **Waterproof Cape.** O. Eidinger, Chicago, Ill., assignor to R. Eidinger, doing business as Meer Made Products.

1,974,246. **Smoking Pipe Holder.** E. R. Littell, St. Bernard, O.

1,974,247. **Pedal.** A. J. Musselman, Cuyahoga Falls, O.

1,974,279 and 1,974,280. **Floor Covering.** R. R. Jones, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,974,297. **Attachment Plug Cap.** G. B. Benander, Yalesville, assignor to Monowatt Electric Corp., Bridgeport, both in Conn.

1,974,378. **Valve.** G. B. Nicoll, assignor to Tyer Rubber Co., both of Andover, Mass.

## Dominion of Canada

344,155. **Windshield Wiper.** R. A. Powell and R. W. Newton, co-inventors, both of Collingwood, Victoria, Australia.

344,183 and 344,184. **Rubber Spring.** A. Spencer, London, England.

344,235. **Milking Machine Teat Cup.** De Laval Separator Co., New York, N. Y., assignee of C. H. Hapgood, Nutley, N. J., both in the U. S. A.

344,287. **Jar Closure.** Vacseal Containers, Ltd., assignee of W. J. Cantopher, J. M. Ogilvie, and H. B. Cronshaw, co-inventors, all of London, England.

344,315. **Wax Applier.** F. D. Croft, Brantford, Ont.

344,347. **Boat Propelling Device.** G. Ranke, Maspeth, N. Y., U. S. A.

344,414. **Conduit.** Goodyear Tire & Rubber Co., assignee of H. E. Morse, both of Akron, O., U. S. A.

344,418 and 344,419. **Sealing Means.** Hydraulic Brake Co., assignee of H. C. Bowen, both of Detroit, Mich., U. S. A.

344,458. **Gasket.** Union Asbestos & Rubber Co., assignee of W. R. Gillies, both of Chicago, Ill., U. S. A.

344,481. **Laundry Bag.** R. B. Baker, Chicago, Ill., U. S. A.

344,495. **Vacuum-Sealed Container.** E. Gore-Lloyd, Langston, England.

344,513. **Arch Protector.** J. E. Stagl, Brooklyn, N. Y., U. S. A.

344,539. **Pneumatic Tire.** Edward G. Budd Mfg. Co., assignee of E. G. Budd, both of Philadelphia, Pa., U. S. A.

344,602. **Typewriter.** Royal Typewriter Co., Inc., New York, N. Y., assignee of B. J. Dowd, W. Hartford, Conn., both in the U. S. A.

344,643. **Tire.** G. F. A. Corts, Gothenburg, Sweden.

344,646. **Foundation Garment.** H. Dungan, Vancouver, B. C.

344,685. **Centrifugal Pump.** Allen-Sherman-Hoff Co., assignee of F. B. Allen, Philadelphia, Pa., U. S. A.

344,705. **Fountain Pen.** Chilton Pen Co., Inc., Long Island City, N. Y., assignee of M. G. Sypher, Belleville, N. J., both in the U. S. A.

344,706. **Fountain Pen.** Chilton Pen Co., Inc., Long Island City, N. Y., assignee of Vaughn-Upton Co., Boston, assignee of H. J. Upton, deceased, in his lifetime of the county of Middlesex, both in Mass., all in the U. S. A.

344,707. **Vaginal Receptacle.** Coezene Co., Cleveland, O., assignee of L. J. Goddard, Miami, Fla., U. S. A.

344,708. **Catamenial Receptacle.** Coezene Co., Cleveland, assignee of A. F. Hagedorn, Rocky River, both in O., U. S. A.

344,767. **Ski Pole Grip and Ring.** A. G. Spalding & Bros. (Canada), Ltd., Brantford, Ont., assignee of J. B. Dickson, Northampton, Mass., U. S. A.

## United Kingdom

408,110. **Vehicle Life Guard.** B. Balsa and J. J. Dehavay, both of Buenos Aires, Argentina.

408,204. **Resilient Mounting.** Firestone Tyre & Rubber Co., Ltd., Brentford, assignee of C. Saurer, Akron, O., U. S. A.
408,209. **Bumper.** A. C. Stevenson, Fleet, Hampshire.
408,851. **Vehicle Arm Rest.** Triumph Co., Ltd., F. Warner, and A. E. Harrison, all of Coventry.
408,864. **Rail and Road Vehicle.** Soc. Anon. Des Pneumatiques Dunlop, Paris, France.
408,937. **Heel Cushion.** Phillips Rubber Soles, Ltd., and G. F. Eyles, both of London.
408,941. **Head Band.** L. Ragosin and L. Knupffer, both of London.
408,944. **Golf Practicing Appliance.** E. J. W. Housden, Croydon.
408,953. **Sole Laying Machine.** British United Shoe Machinery Co., Ltd., Leicester. (United Shoe Machinery Corp., Boston, Mass., U. S. A.)
408,988. **Door Hinge.** S. Smith, Chobham.
409,010. **Football Boot.** J. H. Sunderland, Longton.
409,022. **Price Indicator.** A. E. Landini, Buenos Aires, Argentina.
409,023. **Filter Candles for Artificial Silk.** M. Wilderman, Monaco, France.
409,028. **Reciprocating Pump.** E. A. S. Swinson, Belfast, Ireland.
409,037. **Door Receiving Device.** W. L. R. Amesbury, London.
409,040. **Loud Speaker.** A. H. Stevens, London. (Brush Development Co., Cleveland, O., U. S. A.)
409,056. **Catamenial Appliance.** C. E. Pecknold, Vancouver, Canada.
409,089. **Reservoir Brush.** W. B. Makins and Brown & Makins, Ltd., both of London.
409,097. **Ball Game.** J. Anderson, London.
409,122. **Syringe.** D. Ward, London.
409,124. **Fur Backing.** W. Infield, London.
409,141. **Tire.** Firestone Tyre & Rubber Co., Ltd., Brentford. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)
409,171. **Pipe Coupling Unit.** J. E. Pollak, London. (Soc. des Appareils Boiraults, Paris, France.)
409,186. **Gear Wheel.** British Thomson-Houston Co., Ltd., London, assignee of C. W. Mansur, Malden, Mass., U. S. A.
409,203. **Wearing Apparel.** E. Strange, London.
409,272. **Printing Machine.** H. C. Fleischer, Goppingen, Germany.
409,273. **Elastic Fabric.** G. C. Moore Co., Westerly, R. I., U. S. A.
409,292. **Toy Vehicle.** W. Lines and Lines Bros., Ltd., both of London.
409,306. **Water Bottle Electric Heater.** G. Thornton-Norris, London.
409,323. **Mesh - Reenforced Rubber Road.** J. Singleton-Green, Hull.
409,327. **Rubber Ridged Shirt and Collar.** T. L. Shepherd and Shepherd's Shirts, Ltd., both of Brighton.
409,408. **Draught Excluder.** W. H. McGuffie, Manchester.
409,426. **Toilet.** F. R. Dickinson, Carshalton.
409,440. **Sifting Apparatus.** F. J. and E. West, and West's Gas Improvement Co., Ltd., all of Manchester.
409,459. **Almond Blanching Device.** A. Moore, Hornchurch.
409,462. **Brush.** D. Hayward, Ltd., and S. J. Hayward, both of Bloxwich.
409,482. **Pneumatic Tire.** Dunlop Rubber Co., Ltd., London, and F. G. W. King, Birmingham.
409,510. **Press Button Switch.** International General Electric Co., Inc., New York, N. Y., U. S. A., assignee of Allgemeine Elektricitäts-Ges., Berlin, Germany.
409,517. **Cow Milker.** H. W. Burry, Christchurch.
409,545. **Relief Valve.** Soc. Anon. Des Hauts Fourneaux & Fonderies De Pont-A-Mousson, Pont - á - Mousson, France.
409,548. **Test Paper Apparatus.** B. P. Von Ehrenthal, Anhalt, Germany.
409,559. **Trouser Waistband.** C. & M. Sumrie, Ltd., and S. C. Sumrie, both of Leeds.
409,563. **Motor Support.** P. Pfeiffer, W. Mauz, E. Faber, and L. Hahn, (trading as Mauz & Pfeiffer), all of Stuttgart, Germany.
409,564. **Stuffing Box.** Manifattura Italiana Guarnizioni Per Macchine Colombo & Cie., and R. Colombo, both of Milan, Italy.
409,580. **Hot Water Bottle.** A. Blum, Vienna, Austria.
409,640. **Filter.** J. Wiebe, Saxony, Germany.
409,684. **Electrical Musical Instrument.** L. Mellersh-Jackson, London. (O. Vierling, Berlin, Germany.)
409,705. **Ear Cap.** J. J. Denton, Ltd., Liverpool, and O. M. Halewood, Birkenhead.
409,765. **Seamed Joint.** A.T.S. Co., Ltd., and H. N. Wylie, both of London, and J. Lloyd and G. H. Gould, both of Coventry.
409,780. **Cable.** Macintosh Cable Co., Ltd., Normanton, and A. Sargent, Kilburn.
409,800. **Rubber-coated Metal Roofing.** Lysaght Protected Steel Co., Ltd., and H. W. Keay, both of Bristol.
409,814. **Windscreen.** Perfecta Motor Equipments, Ltd., and V. H. Pinson, both of Birmingham.
409,817. **Securing Railway Rails to Sleepers.** B. S. Davies, Woking, and P. A. Summers, Osterley.
409,874. **Dress Shield.** J. P. Wagner and Wagner & Brandon, Ltd., both of London.
409,876. **Sheaths for Cattle's Horns.** H. V. Dyke, Auckland, New Zealand.
409,919. **Collapsible Tube Closure.** British Colloids, Ltd., and F. J. W. Thompson, both of London.
409,938. **Hat.** V. W. Webb, London.
409,950. **Window Scaffold.** E. Sorensen, Berlin, Germany.
409,955. **Electric Arc Welding.** W. R. Hume and Hume Steel, Ltd., both of Melbourne, Australia.
409,968. **Shock Absorber.** E. Bugatti, Molsheim, Bash-Rhin, France.
409,987. **Exerciser.** T. Williams, Syracuse, and H. Casler, Canastota, both in N. Y., U. S. A.
409,990. **Engine and Gear Box Mounting.** E. Bugatti, Molsheim, Bas-Rhin, France.
409,991. **Metal Tube.** Power Flexible Tubing Co., Ltd., London. (O. Meyer-Keller & Cie., A.G., Lucerne, Switzerland.)
410,000. **Railway Vehicle Undercarriage.** E. C. Noble, Buenos Aires, Argentina.
410,002. **Bottle Capsule Machine.** Kork-N-Seal, Ltd., London.
410,011. **Boot.** T. Grainger, Pontypool.
410,012. **Siren.** Echometer Ges., Kiel, Germany.
410,080. **Stopper.** O. Nagy, Budapest, Hungary.
410,107. **Vehicle Clutch Operating Mechanism.** E. Aubin, W. Wittering, A. W. Claremont, London, (representatives of Sir F. H. Royce), and B. I. Day, Allestree.
410,120. **Pipe Joint.** Mannesmann-Rohren-Werke, Düsseldorf, Germany.
410,122. **Spring Upholstery.** J. E. L. Marshall, Sandiacre.
410,141. **Granular Material Disintegrater and Washer.** T. Dodds, Sunderland.
410,161. **Antiseptic Solution Apparatus.** R. Desplat and Compagnie Electro Salvator, Bordeaux, France.
410,178. **Adhesive Applier.** United Shoe Machinery Corp., Boston, assignee of G. A. Miner, Medford, both in Mass., U. S. A.
410,179. **Cable.** S. L. James, London.
410,181. **Fly Catcher.** H. D. Sewill, Westcliff-on-Sea.
410,210. **Trouser Waistband.** C. R. Pratt, London.
410,218. **Window Holder and Fastening.** C. G. Marks, Burnley.
410,242. **Footwear.** R. T. Tarrant, Napton.
410,246. **Windscreen Cleaner.** R. P. Lark, Wallington, and F. Young, London.
410,253. **Indicating Board.** F. J. Heath, Hove.
410,255. **Brake.** India Rubber, Gutta Percha & Telegraph Works Co., Ltd., and F. J. Tarris, both of London.
410,258. **Bandage.** F. J. Farrell and Grout & Co., Ltd., both of Great Yarmouth.
410,282. **Flexible Unjointed Hinge.** V. A. Trier, London.
410,290. **Billiard Table.** A. V. Roe & Co., Ltd., and R. H. Dobson, both of Manchester.
410,308. **Label.** United States Rubber Co., assignee of P. Adamson, both of New York, N. Y., U. S. A.
410,348. **Jack.** H. W. Sherlock, Glenageary, Co. Dublin, Ireland.
410,367. **Fluid Pressure Brake.** J. W. White, Detroit, Mich., U. S. A.
410,379. **Hearing Tester.** A. Roth, Brooklyn, N. Y., U. S. A.
410,398. **Offset Printing Roller.** J. J. V. Armstrong, Liverpool. (G. Vonwebern, Dayton, O., U. S. A.)
410,427. **Filter.** F. Zimmer's Erben A. G., Varnsdorf, Czechoslovakia.
410,437. **Reservoir Pen.** Namiki Mfg. Co., Ltd., London. (Kabushiki Kaisha Namiki Seisakusho, Tokio, Japan.)
410,442. **Atomizer.** Aktieselskabet Danapin, Copenhagen, Denmark.
410,452. **Heel.** R. H. Boag, Auckland, New Zealand.
410,460. **Book Cover.** H. H. Straus, New York, N. Y., U. S. A.
410,461. **Boot.** A. Conti, Paris, France.
410,485. **Printing Surface.** H. Beckmann, Berlin, Germany.
410,502. **Air Cushion.** D. Moselev & Sons, Ltd., Manchester, and C. Dossunet, Montreuil, France.
410,504. **Motor Cycle Weather Guard.** V. J. Sexton, London.
410,507. **Extensible Shirts and Collars.** T. L. Shepherd and Shepherd's Flexible Fabrics, Ltd., both of Brighton.
410,529. **Card Clothing.** L. S. M. Lejeune, Nord, and J. E. C. Bongrand, Paris, both in France.
410,531. **Inflating Valve.** L. Rapp, London.
410,533. **Game.** A. White, Hereford.
410,535. **Diaphragm.** F. Harrison, Braintree.

410,582. **Vehicle Window Frame.** H. L. Sleigh, A. S. Cheston, and F. J. Stuart, all of Birmingham.
410,617. **Trouser Waistband.** A. Simpson, London.
410,670. **Billiard Table.** J. R. Tucker, Scarborough.
410,721. **Pipe Coupling.** J. A. Jobling & Co., Ltd., and H. W. Howes, both of Sunderland.
410,735. **Tire.** Compagnie Francaise Du Caoutchouc, Neuilly-sur-Seine, France.
410,755. **Golf Club Bag.** J. H. Lawrence, London.
410,803. **Shoe.** United Shoe Machinery Corp., Boston, assignee of C. F. Pym, Beverly, both in Mass., U. S. A.
410,812. **Door Check.** J. T. Smith and Silent Travel, Ltd., both of London.
410,923. **Tire.** General Tire & Rubber Co., assignee of A. G. Maranville, both of Akron, O., U. S. A.
410,930. **Regenerated Cellulose Skin Drier.** Courtaulds, Ltd., London, and C. F. Topham, Coventry.
410,931. **Regenerated Cellulose Skin Drier.** Courtaulds, Ltd., London, and E. A. Morton, Coventry.
410,935. **Specific Gravity Estimator.** F. H. Alston, Birmingham.
410,937. **Tractor Wheel Attachment.** Dunlop Rubber Co., Ltd., London, and W. E. Hardeman and R. F. Daw, both of Birmingham.
410,949. **Chalk Holder.** G. H. Witcomb, Brighton.
410,977. **Upholstery Padding.** International Latex Processes, Ltd., St. Peter's Port, Channel Islands, assignee of Magyar Ruggyantaarugyar Reszvenytarsasag, Budapest, Hungary.
410,983. **Vibration Damper.** Rover Co., Ltd., and M. C. Wilks, both of Coventry.
411,005. **Motor.** L. Deisenhammer, Vienna, Austria.
411,014. **Throw Disk.** Hessische Gummiwaren-Fabrik F. Peter A. G., Klein-Auheim-on-Main, Germany.
411,084. **Football.** A. Simplisse, Liege, Belgium.
411,097. **Railway Vehicle Buffer.** A. Sanderson, Dronfield.
411,214. **Respiratory Apparatus.** J. M. G. Giraudet De Boudemange, Paris, France.
411,217. **High-Frequency Oscillation Generator.** H. A. Thomas, Teddington.
411,222. **Baby Soother.** B. Woolf, Birmingham.
411,269. **Clothing Material.** United States Rubber Co., assignee of P. Adamson, both of New York, N. Y., U. S. A.
411,312. **Aerial.** G. Urizio, Pola, Italy.
411,362. **Discharge Apparatus.** British Thomson-Houston Co., Ltd., London, assignee of T. E. Foulke, Nutley, N. J., U. S. A.
411,379. **Teething Pad.** P. L. G. Sylvain, Montreal, Canada.
411,392. **Dress Shield.** J. Rath, Berlin, Germany.
411,408. **Artificial Leg Knee Joint.** G. Greissinger, Vaihingen, Germany.
411,448. **Boot Making Machine.** British United Shoe Machinery Co., Ltd., A. Bates, W. R. Barclay, and G. Hazelton, all of Leicester.
411,451. **Artificial Teeth.** W. W. Hobday, Worcester.
411,494. **Portable Drilling Machine.** R. Bosch A. G., Stuttgart, Germany.
411,543. **Veterinary Appliance.** A. Hunter, Blackford.
411,727. **Tire.** J. Pollak, London. (Gummiwerke Fulda A. G., Fulda, Germany.)
411,749. **Tire.** A. Berchtold, Zurich, Switzerland.
411,765. **Railway Wheel.** G. F. A. Corts, Gothenburg, Sweden.
411,810. **Multi-Part Article Assembler.** Stocko - Metallwarenfabriken Ges., Elberfeld, Germany.
411,865. **Massage Appliance.** C. Cahier, London.

### Germany

601,366. **Sponge Rubber Seat.** Societe H. & F. de Poix & Cie., Rueil, Seine et Oise, France. Represented by G. Weissberger, Berlin.
601,978. **Tire.** B. Mundhass, Berlin-Charlottenburg.
602,100. **Bandage.** Surgical Dressings, Inc., Jamaica Plain, Mass., U. S. A. Represented by C. Huss, Berlin.
602,159. **Rubber Repair Sheet.** Continental Gummi-Werke A. G., Hannover.
602,269. **Rubber Insulated Wires.** Kabelfabrik A.G., Pressburg, Czechoslovakia. Represented by C. Grunberg, Berlin.
602,678. **Rubber Closure for Inflatable Balls.** K. Timme and C. Wache, both of Dresden.
602,849. **Rubber Insulated Wires.** Kabelfabrik A.G., Pressburg, Czechoslovakia. Represented by C. Grunberg, Berlin.

---

## TRADE MARKS

### United States

315,860. Representation of a section of rubber flooring on which are trodding 4 pair of legs, and above the words: **"Traffic-Proof Finish."** Flooring and accessories. Hamilton Rubber Mfg. Co., Trenton, N. J.
315,966. **Trutest.** Pressure gages. A. Schrader's Son, Inc., Brooklyn, N. Y.
315,989. **Swat-Me-Kid.** Resilient string projected ball and pivoted target toy. F. S. B. Toy Mfg. Co., Springfield, Mo.
315,997. **Artlastic.** Corsets, brassieres, etc. Artlastic Foundations, Inc., New York, N. Y.
316,006. Representation of a shield containing 2 stars, 2 bats, a ball on which appears the word: **"Official,"** and the words: **"American Soft Ball Association, Inc.,"** and below this representation the words: **"Geo. H. Sisler, Pres."** Baseballs. American Soft Ball Association, Inc., St. Louis, Mo.
316,085. **Crest.** Tires and tubes. Gamble Stores, Inc., Minneapolis, Minn.
316,086. **G & S.** Tires and tubes. Gamble Stores, Inc., Minneapolis, Minn.
316,116. **Beaux Arts.** Pencils, erasers, etc. Wallace Pencil Co., Maplewood, Mo.
316,118. **Titleist.** Golf balls. Acushnet Process Co., Acushnet, Mass.
316,159. Label containing the word: **"Mastercraft."** Tires. Inland Rubber Co., Chicago, Ill.
316,164. **Stutt Garter.** Garters. H. Loeb & Co., Inc., New York, N. Y.
316,181. **Air O Flow—Air Flows In—Air Flows Out.** Footwear. Cambridge Rubber Co., Cambridge, Mass.
316,209. Word: **"Dot"** between 2 arrows. Metatarsal arch indicators and sponge rubber arch supports. C. E. Williams, Cleveland, O.
316,212. **Gracies.** Girdles. Grace Corset Co., Kalamazoo, Mich.
316,213. **Kesso DeLuxe.** Household gloves. McKesson & Robbins, Inc., Bridgeport, Conn.
316,217. **Kralex.** Innersoles. United States Rubber Co., New York, N. Y.
316,268. **Aquapruf.** Brake lining. Firestone Tire & Rubber Co., Akron, O.
316,308. Segment of a circle upon which appear 3 broken parallel lines, representation of a winged foot, and the word: **"Hermes."** Prophylactic rubber cots. Ultrex Corp., Minneapolis, Minn.
316,309. **Peter Pan.** Nipples. Pyramid Rubber Co., Ravenna, O.
316,311. **Loujai.** Corsets, brassieres, etc. Jay-Thorpe, Inc., New York, N. Y.
316,413. **Dunlopillo.** Gymnasium pads. Dunlop Tire & Rubber Corp., Buffalo, N. Y.
316,414. **Vulcobase.** Tire valve. A. Schrader's Son, Inc., Brooklyn, N. Y.
316,525. Label containing the words: **"Triple XXX Products."** Storage batteries. Triplex Stores, Inc., New Haven, Conn.
316,530. Representation of an automobile engine front having a pair of ornaments simulating wings, and across the engine the words: **"Champ-Items."** Automobile specialties and devices. Champion Anti-Rattler Co., Inc., St. Louis, Mo.
316,549. **Moldex.** Adhesive cements. L. Karfunkle, doing business as Moldex Products, Brooklyn, N. Y.
316,554. Representation of a winged foot between the words: **"Good Year."** Inner tubes and tube repair kits. Goodyear Tire & Rubber Co., Akron, O.
316,572. **Graball.** Footballs and basketballs. A. J. Reach Co., Philadelphia, Pa.
316,632. **Rugtite.** Rug anti-slip liquid adhesive composition. B. Aronovitch, doing business as Mayer Co., Dorchester, Mass.
316,696. **Electro-Pak.** Electric storage batteries. B. F. Goodrich Co., New York, N. Y.
316,748. Red, brown, and buff wrapper containing representation of a roll of adhesive tape, and written across it the word: **"Trutex;"** and in 4 corners of the wrapper appear the letters: **"SR"** within a circle. Painters' adhesive tape. Seamless Rubber Co., Inc., New Haven, Conn.
316,802. Representation of an iron cross, and on it the words: **"Lac"** and **"Vac."** Nursing bottles and nipples. Triangle Service Corp., Spokane, Wash.
316,860. Representation of John Bull, and below it the words: **"John Bull."** Tires, inner tubes, washers, brake blocks, patches, valve, gas, and wiper tubing, drive belts, and valve seatings. Leicester Rubber Co., Ltd., Leicester, England.
316,896. **Better Bilt.** Fan belts, piston rings, and inner tubes. Harrison Wholesale Co., Chicago, Ill.
316,927. **Sweet Shot.** Golf balls. Worthington Ball Co., Elyria, O.
317,023. **Ginger.** Dolls. Ideal Novelty & Toy Co., Brooklyn, N. Y.
317,064. Label containing the letter: **"S."** Electrical insulation tape and sleeving and tubular braided insulating fabric. John Sidebotham, Inc., Frankford, Pa.

317,065. **Medi - Spray.** Atomizers. Gest-Beaumont, Inc., Milwaukee, Wis.

317,095. **Trojan.** Tires. United States Rubber Co., New York, N. Y.

317,103. Representation of a crown, and below it the word: **"Empress."** Toys, including balloons. M. Pressner & Co., New York, N. Y.

317,119. **Atlas.** Vulcanizers. Atlas Supply Co., Newark, N. J.

317,227. **Akroflex.** Antioxidant. E. I. du Pont de Nemours & Co., Wilmington, Del.

317,229. **Ace-Sil.** Storage battery separators. American Hard Rubber Co., Hempstead, N. Y.

317,257. **Ezemount.** Tire valve dust caps and valve caps. A. Schrader's Son, Inc., Brooklyn, N. Y.

317,280. Triangle containing the words: **"Fix"** and **"Trade Mark."** Flexible composition heel protectors. W. R. Kern, doing business as Kern Co., New York, N. Y.

317,295. **Hydrex.** Preparation of fatty acid of marine, animal, and vegetable origin for use as a rubber compounding ingredient, etc. W. C. Hardesty Co., Inc., New York, N. Y.

317,330. **Rotax.** Accelerator. Goodyear Tire & Rubber Co., Akron, O.

317,331. **Plastex.** Chemicals and compositions for altering the physical and chemical properties of rubber compositions. Binney & Smith Co., New York, N. Y.

## Ceylon

(*Continued from page* 56)

would mean an expense of 5 rupees per acre per annum, excluding the cost of the machine, for the latter estates.

At a recent meeting of the Board of Agriculture, the chairman, Dr. Youngman, referred to the well-known Dutch authority, Dr. Cramer, and his remarks on the subject of Ceylon rubber. Dr. Cramer had been in Indo-China, working in bud-grafting, under instructions of the French Colonial Office; then he left for Belgian Congo at the personal request of the late King Albert to investigate the rubber problem there. On his return he wrote to Dr. Youngman stating he believed the future of rubber in Indo-China and in Africa was very largely bound up with the fact that there it was planted on level land. He thought that the rubber planted on slopes in Ceylon from that aspect alone, leaving aside the question of bud-grafting, would not be able to hold its own with rubber planted on level lands, especially in Indo-China.

## Indo-China

Various experiments in surfacing roads with rubber have been conducted in the Far East, chiefly in Malaya and more recently in Netherland India. Now a recent communication[1] reveals this matter is also being taken up in Indo-China. There M. Laignelot, an engineer of the Public Works Department at Kompong-Cham, has devised a method of substituting a surface of latex and sand for the usual asphalt top on metaled roads. On 300 meters of the Route Coloniale No. 22, between Suong and Chup, 3,000 liters of latex were spread by an asphalt spreader, which works out as 660 grams or almost 1½ pounds of dry rubber per square meter; this latex then was covered with sand and later on rolled. After this section had been in use 2 months examination showed that the coating, tacky underneath, was quite dry, non-tacky, and very firm at the surface where the sand, dust, and rubber had formed a hard compact mass apparently more resistant than asphalt.

At present rates for asphalt and rubber (while the price for the latter has increased, that of the former has dropped), the cost of a rubber surface is almost double that of one of Japanese asphalt and ⅓ more than that of Shell asphalt. At prices prevailing some months ago the latex cover would have cost only ⅔ the price of one of asphalt. The greater durability of the latex cover, however, may more than make up for the higher initial cost. This belief, of course, is something that will be impossible to decide until a latex-sand road has seen at least 5 to 6 years' service.

Meantime M. Laignelot's work attracted the attention of the Scientific Department of the Société des Plantations des Terres Rouges; so the department in collaboration with M. Laignelot has continued experiments for the above concern and for the Compagnie du Cambodge.

A new series of preliminary tests was started on 20 meters of metaled road on the Chup estate. This section was divided into 10 parts, and each covered with ordinary latex, as well as creamed latex, besides sulphur, cement, and sand. The proportions of the ingredients and the method of handling differed for each plot. Creamed latex was used to obtain a product more stable and resistant as well as easier to handle than the latex. Owing to the smallness of the test areas no conclusive opinion can as yet be given, but the data obtained will prove useful in further experiments conducted on a larger scale.

[1] *Bull. Syndicat des Planteurs de Caoutchouc de l'Indochine,* July 11, 1934, pp. 109-13.

## New York Group

(*Continued from page* 46)

with a smooth efficiency that can be accounted for only by the inherent ability of the Englishman suavely and tactfully to direct the activities of the Malay natives. After the lecture movies covering many of the high points of Mr. Wiegand's recent trip around the world were shown and explained.

The Group will hold its annual business meeting and Christmas Party December 14 at the same location. This meeting will follow the highly approved customs of gifts and fun that have established it as an institution among the rubber chemists. Bruce Silver, secretary, will be greatly assisted in the proper performance of his office if the $2 for reservation is accompanied with an additional $1 for dues.

## Los Angeles Group

THE fall meeting of the Los Angeles Group, Rubber Division, A. C. S., took place October 20 at the Montebello Country Club. The Rubber Division cup was again in competition on the regular handicap basis in the golf tournament.

The regular dinner meeting of the group to be held November 15 will be addressed by E. Billings, vice president of Godfrey L. Cabot, Inc., Boston, Mass., who will speak on recent developments in the carbon black industry.

The December gathering, for which no precise day has yet been set, will be the annual meeting at which an election of officers will be held. The business portion of this session will be followed by an address on "Present Day Methods of Reclaiming Rubber," by Mr. Miller, of the Xylos Rubber Co.

## Industrial Production

(*Continued from page* 54)

been the sharp drop in the production of iron and steel and their products. This decline continued from June until September, and was most severe in July. In September the shrinkage in the output of textiles, accentuated by the great strike, was an important element in reducing the general level of production. Other elements in the industrial contraction of the third quarter have been the considerable decrease in the production of automobiles and the restricted volume of building construction, which remains small despite recent expansion in publicly financed projects.

The elements of production which have been most resistant to the industrial contraction are those of a consumers goods nature. Thus the manufacture of food products has increased in volume. Tobacco manufacturers, leather and shoe production, and, to a lesser extent, rubber tire production have shown almost no decline. *Cleveland Trust Co. Business Bulletin.*

## Reogen

Reogen is a strong thermo-plasticizing agent for rubber effective in small dosages.

It is non-toxic and has no effect on the aging of cured compounds. It does not bloom out of rubber, but tends to prevent the blooming of other materials. It has a slight retarding action on cure at low curing temperatures; this property, together with its function of reducing working temperatures by plasticizing the rubber, gives Reogen valuable scorch-preventing advantages.

The composition of Reogen follows: Sulpo A, a sulphonated petroleum product, 15 parts; normal butyl alcohol, 5 parts; mineral oil, 80 parts. It has the consistency of medium thin oil, clear mahogany color, and weighs 7.15 pounds per gallon.

# Market Reviews

## CRUDE RUBBER

### Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

| Futures | Sept. 1 | Sept. 29 | Oct. 6 | Oct. 13 | Oct. 20 |
|---|---|---|---|---|---|
| Oct. ... | 15.84 | 14.82 | 13.75 | 14.33 | 13.81 |
| Nov. ... | .... | 14.93 | 13.86 | 14.44 | 13.91 |
| Dec. ... | 16.11 | 15.04 | 13.98 | 14.58 | 14.01 |
| Jan. .... | .... | 15.17 | 14.09 | 14.70 | 14.13 |
| Mar. ... | 16.49 | 15.42 | 14.36 | 14.99 | 14.42 |
| May ... | 16.74 | 15.64 | 14.59 | 15.20 | 14.62 |
| July ... | 17.00 | 15.89 | 14.78 | 15.42 | 14.82 |
| Sept. ... | .... | .... | 15.02 | 15.66 | 15.02 |
| Volume for week (tons) .... | | 20,970 | 37,050 | 19,760 | 11,910 |

THE above table gives the first and last week-end closing prices of the month previous to that under review, also the week-end closing prices of each week of this review. This plan permits tracing at a glance the trend of prices on each future for approximately 2 consecutive months.

October was ushered in on the bearish wake of September's net recession of 102 to 111 points, half of which occurred during the final week.

Week ended October 6. Here occurred an accelerated continuation of recession netting further losses of 106 to 111 points although the period ended with an upturn.

Sharp curtailment of automobile production (*Cram's Reports*), continued decline of sterling, bearishness of London and Singapore rubber futures as well as domestic grains and commodities, and the disappointment, in trading circles particularly, occasioned by President Roosevelt's radio address, all contributed, according to *The Journal of Commerce,* to the severe decline of prices.

In addition it says, "A message from The Hague appeared to play a part in the new outburst of selling. It said that the Director of the Economic Department intimated in an interview with the press that the present estate rubber prices are satisfactory, as the realization of the British rubber industry's price ideas of 9d. would stimulate production in non-restriction areas as well as production of synthetic rubber;" and " . . . the market had grown top-heavy during an extended period of advances due to unliquidated bull accounts. With the selling out of these stale long lines, a stronger technical position has followed . . . ."

Strength on the last day and long pull optimism seemed to be influenced by the bracing of sterling, reduced plantation exports showing evidence of the effectiveness of restriction, belief that exports during first half of 1935 will fall below quota, and Firestone's forecast of higher rubber prices.

Week ended October 13. The Commodity Exchange was closed Friday, Columbus Day, and Saturday. Monday started with a continuation of the upturn, encouraged apparently by the sharp rise of cotton and strength in other commodities. The disquieting events at Marseilles, a break in the London market, and fluctuations of sterling turned the tide sharply downward to new low points in the early nervousness of Tuesday's trading. Later in the day improvement of sterling brought a slight closing recovery, which continued to improve during the remainder of the short trading week. A net gain of 58 to 64 points was registered in the period. Contributing causes seemed to be covering of outstanding shorts before the holiday, view of higher silver, strong commodity markets here and abroad, the President's expressed desire for higher prices, and bullish restriction news. *The Journal of Commerce,* October 13, indicated that instead of relaxing restrictions the Dutch authorities have announced an export duty of 20 guilders per kilo on native rubber effective November 1, and other duties are contemplated.

That restriction has had a very decided effect already is evidenced by Borneo and Sumatra native section shipments: May 35,000 tons; June 15,400 tons; July 14,300 tons; and August 11,000 tons.

Week ended October 20. The beginning of the week proved that the previous weeks' growing optimism had disappeared during the holiday weekend as evidenced by Monday's break of 52 to 57 points. Anti-inflation inferences from Washington and the general weakness of other commodities seemed responsible. Zig-zag fluctuations with slightly downward trend, following the pattern set by sterling and London prices, characterized trading during the week, which netted losses of 52 to 64 points.

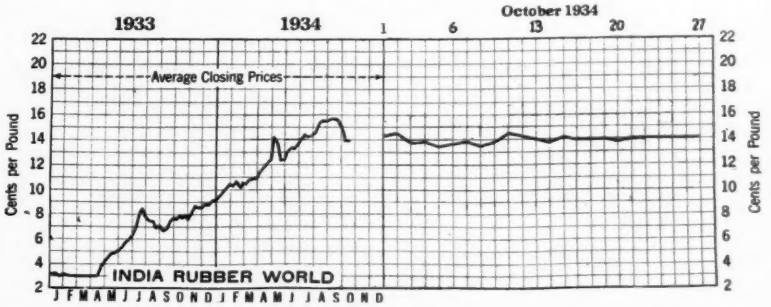
Rubber futures started the week of October 22 with a firm tone, advancing 2 to 8 points over the previous week's close, and this rise in spite of slightly lower sterling and commodity prices. Tax figures for September indicated a pick-up in tire sales. This report along with better sterling further stimulated rubber 9 to 14 points. Closing prices October 24, however, were slightly down on the news of Malayan increased production, 42,097 tons in September as against 39,369 tons in August. Closing prices were above the previous week-end by 10 to 16 points: October 13.97¢, November 14.65, December 14.14, January 14.25, March 14.52, May 14.72, July 14.93, and September 15.13.

On October 25, however, rubber futures strengthened moderately at the start of trading in response to the President's address to bankers the night before, but later futures lost ground because of setbacks in domestic markets, slightly easier cables, and the lack of activity in the crude. The entire list closing prices were 5 to 9 points lower than at the end of the previous day.

### New York Outside Market

The downward trend of spot prices during the past month is shown in the following week-end closing prices: September 22, 15⅜¢; September 29, 14⅛¢; October 6, 13¾¢; October 13, 14½¢; and October 20, 13⅞¢.

Week ended October 6. Spot rubber declined 1⅛¢. Buyers were apathetic because of the unsavory condition of the futures market. Conditions affecting both seemed to reside essentially in the behavior of sterling, lack of manufacturers' interest, no doubt affected by the sharp decline of motor car production, and the rumors of possible attempts by some minor plantation interests to defy restriction regulations.




New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

Week ended October 13. Trading stopped October 11 after a relatively quiet period. The daily price structure again followed generally the curve established by the futures market. A net gain of ¾¢ was registered for the period due to increasing interest displayed by manufacturers, also to the same bullish restriction news that affected futures.

Week ended October 20. Spot prices lost 5/8¢. In sympathy with the futures market the week started with a sharp reduction, halted and steadied by some evidence of a slight manufacturers' demand. Fluctuations during the week were confined to a ¼¢ range above the closing price of 13⅞¢.

The week of October 22 opened with a slight improvement; the price was 14⅛¢. Little demand characterized this period, but the market seemed fairly firm with the slight fluctuations showing no trend. Spot on October 25 was 13⅞¢.

## New York Quotations

*New York outside market rubber quotations in cents per pound*

| | Oct. 25, 1933 | Sept. 25, 1934 | Oct. 26, 1934 |
|---|---|---|---|
| **Plantations** | | | |
| Rubber latex, normal .....gal. | 72 | 58½ | 54 /55½ |
| **Sheet** | | | |
| Ribbed smoked, spot | 7⅛/7½ | 15⅜/15⅞ | 14 /14⅛ |
| Nov.-Dec. | 7½/7⅝ | .... .... | 14⅛/14¼ |
| Jan.-Mar. | 7¾ | 15 13/16 | 14⅜/14½ |
| Apr.-June | 8 | 16 1/16/16⅜ | 14¾/14⅞ |
| **Crepe** | | | |
| No. 1 thin latex, spot | 8⅜ | 16¼/16½ | 14⅞/15⅛ |
| Nov.-Dec. | 8⅛/8½ | .... .... | 14⅛/15¼ |
| Jan.-Mar. | 8⅝ | 16¾/17 1/16 | 15 1/16/15½ |
| Apr.-June | 8¾/8⅞ | 17¼/17⅜ | 15½/15⅞ |
| No. 3 Amber, spot | 5¾/5½ | 12½/12¾ | 11½ |
| No. 1 Brown | 5½/5⅝ | 12½/12⅞ | 11⅝/11¾ |
| Brown rolled | 4⅜ | 10⅝/10⅜ | 9⅜/ 9½ |
| **Paras** | | | |
| Upriver fine | 8½ | 11 | 10¼ |
| Upriver fine | *11¼ | *14¾ | *13¾ |
| Upriver coarse | 6 | 8½ | 7¾ |
| Upriver coarse | *10 | *11 | *11 |
| Islands fine | .. | 11½ | 10½ |
| Islands fine | *11 | *14⅝ | *13¾ |
| Acre, Bolivian fine | 9 | 11¼ | 10½ |
| Acre, Bolivian fine | *11½ | *15 | *14 |
| Beni, Bolivian | 9 | 11¼ | 10½ |
| Madeira fine | 8¾ | 11 | 10¼ |
| **Caucho** | | | |
| Upper ball | 6 | 8½ | 7½ |
| Upper ball | *10 | *11 | *11 |
| Lower ball | .. | 8 | 7 |
| **Pontianak** | | | |
| Bandjermasin | 7 | .. | 6 |
| Pressed block | 12 | .. | 10½ |
| Sarawak | 7 | .. | 6 |
| **Manicobas** | | | |
| Manicoba, 30% guar. | †3¾ | †7¾ | .. |
| Mangabiera, thin sheet | .. | .. | .. |
| **Guayule** | | | |
| Duro, washed and dried | 12 | 12 | 12 |
| Ampar | 13 | 13 | 13 |
| **Africans** | | | |
| Rio Nuñez | 11 | 12 | 12 |
| Black Kassai | 9 | 12 | 10 |
| Prime Niger flake | 20 | 20 | 25 |
| **Gutta Percha** | | | |
| Gutta Siak | 12 | .. | 9¼ |
| Gutta Soh | 14 | .. | 14 |
| Red Macassar | 1.35 | .. | 1.40 |
| **Balata** | | | |
| Block, Ciudad Bolivar | 30 | .. | 42 |
| Manaos block | 30 | .. | 32 |
| Surinam sheets | 38 | .. | 42 |
| Amber | 40 | .. | 45 |

*Washed and dried crepe. Shipments from Brazil. †Nominal.

## Calpar

The cultivated 4-year-old guayule shrub, when triturated and treated by improved manufacturing processes, produces Calpar, a very clean stabilized rubber of higher quality and wider application than earlier types of guayule. The plasticizing properties make Calpar especially valuable as a tacking agent in friction stocks, as an anti-scorching ingredient in extruded products, and as a smoothing material for calendered sheets of particular surfacing requirements.

## Uncured Rubber in Cables

If vulcanized rubber is used in the form of a strip wrapped around the wire, the resultant covering is not really continuous since the parts of the rubber in contact with each other do not adhere, and displacement of gas or vapor is possible between conductor and rubber layer. Unvulcanized rubber, however, does adhere to itself under pressure so that it forms a continuous and homogeneous sheath. Furthermore, if any slight weakness develops locally in the rubber covering because of irregularities of the surface of the wires or by their displacement, this weakness is automatically repaired in the case of the plastic natural rubber.

## A Correction

The following is a financial report from the Intercontinental Rubber Co., Wilmington, Del., and subsidiaries, correcting the statement in our September issue. Six months ended June 30: net loss, after taxes, interest, and depreciation $39,891.89 against a net loss of $41,650.14 in the same period in 1934, not the figures given in our September issue, $232,455 and $146,799, respectively. These figures, exactly, $232,454.85 and $146,798.85, are for the surplus account for the periods under review.

The actual addition to the deficit for the first half of 1934 was only $12,227.39.

The apparent difference in these figures is caused by a change in the showing of a credit for profit on securities sold in the surplus account instead of in the income account, as was done in 1933.

## Tire Production Statistics

| | Pneumatic Casings—All Types | | |
|---|---|---|---|
| | Inventory | Production | Total Shipments |
| 1932 | 6,115,487 | 32,067,732 | 32,200,820 |
| 1933 | 7,110,456 | 36,243,384 | 35,274,970 |
| 1934 | | | |
| Jan. | 9,393,857 | 3,803,939 | 3,125,726 |
| Feb. | 10,403,282 | 4,205,039 | 3,186,363 |
| Mar. | 11,301,142 | 5,024,718 | 4,096,273 |
| Apr. | 11,621,310 | 4,626,881 | 4,305,227 |
| May | 10,792,770 | 4,322,536 | 5,171,748 |
| June | 9,912,780 | 4,211,905 | 5,071,403 |
| July | 9,153,712 | 3,252,251 | 4,032,689 |
| Aug. | 8,436,236 | 3,426,652 | 4,179,022 |
| | **Solid and Cushion Tires** | | |
| 1932 | 23,830 | 97,089 | 108,581 |
| 1933 | ..... | 130,987 | 126,990 |
| 1934 | | | |
| Jan. | 29,971 | 13,792 | 13,946 |
| Feb. | ..... | 12,440 | 12,797 |
| Mar. | 28,280 | 15,017 | 15,273 |
| Apr. | ..... | 16,217 | 13,701 |
| May | ..... | 18,639 | 17,551 |
| June | ..... | 21,385 | 19,487 |
| July | ..... | 18,283 | 17,807 |
| Aug. | ..... | 17,864 | 16,283 |
| | **Inner Tubes—All Types** | | |
| 1932 | 5,399,551 | 29,513,246 | 30,328,536 |
| 1933 | 6,251,941 | 34,044,689 | 33,112,472 |
| 1934 | | | |
| Jan. | 8,150,708 | 3,444,574 | 3,102,931 |
| Feb. | 8,892,154 | 3,956,082 | 3,223,591 |
| Mar. | 9,936,574 | 5,038,649 | 3,994,683 |
| Apr. | 10,267,331 | 4,593,370 | 4,212,020 |
| May | 9,741,304 | 4,228,239 | 4,754,683 |
| June | 8,531,574 | 3,974,408 | 5,149,951 |
| July | 7,811,828 | 3,425,352 | 4,193,210 |
| Aug. | 7,328,404 | 3,569,626 | 4,072,352 |

| | Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires | | Consumption of Motor Gasoline (100%) |
|---|---|---|---|
| | Cotton Fabric Pounds | Crude Rubber Pounds | Gallons |
| 1932 | 128,981,222 | 416,577,533 | 15,703,800,000 |
| 1933 | 148,989,293 | 512,489,423 | 15,880,746,000 |
| 1934 | | | |
| Jan. | 16,437,210 | 59,957,163 | 1,239,798,000 |
| Feb. | 18,720,923 | 63,400,171 | 1,047,816,000 |
| Mar. | 20,927,389 | 75,636,859 | 1,298,472,000 |
| Apr. | 19,371,041 | 69,930,591 | 1,374,870,000 |
| May | 18,785,428 | 67,636,897 | 1,601,922,000 |
| June | 17,715,577 | 61,849,622 | 1,524,432,000 |
| July | 13,267,392 | 49,352,977 | 1,583,190,000 |
| Aug. | 13,724,148 | 50,419,339 | 1,635,186,000 |

*Rubber Manufacturers Association, Inc., figures representing approximately 97% of the industry for 1934 and 80% for previous years, with the exception of gasoline consumption.*

## New York Outside Market—Spot Closing Rubber Prices—Cents per Pound

| | September, 1934 | | | | | | October, 1934 | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 24 | 25 | 26 | 27 | 28 | 29 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 12* | 13* | 15 | 16 | 17 | 18 | 19 | 20 |
| No. 1 Ribbed Smoked Sheet | 15⅜ | 15¼ | 15 | 14⅛ | 14¾ | 14⅛ | 14¼ | 14½ | 13⅞ | 13⅞ | 13⅝ | 13¾ | 13⅞ | 13½ | 13⅞ | 14½ | .. | .. | 13⅞ | 14⅛ | 14 | 14 | 14 | 13⅞ |
| No. 2 Ribbed Smoked Sheet | 14¾ | 14¾ | 14⅜ | 14⅛ | 14 | 14 | 13½ | 13⅜ | 13¼ | 13⅛ | 13 | 13⅛ | 13¼ | 12⅞ | 13¼ | 13⅜ | .. | .. | 13¼ | 13½ | 13⅜ | 13⅜ | 13⅜ | 13¼ |
| No. 3 Ribbed Smoked Sheet | 14⅜ | 14½ | 14⅝ | 14 | 13¾ | 13⅛ | 13⅛ | 13½ | 13 | 13 | 12¾ | 12⅞ | 13 | 12⅝ | 13 | 13⅜ | .. | .. | 13 | 13¼ | 13⅛ | 13⅛ | 13⅛ | 13 |
| No. 4 Ribbed Smoked Sheet | 14¼ | 14¼ | 13⅞ | 13¾ | 13½ | 13⅛ | 13⅛ | 13⅜ | 12⅛ | 12⅞ | 12⅝ | 12¾ | 12⅞ | 12½ | 12⅞ | 13½ | .. | .. | 12⅞ | 13⅛ | 13 | 13 | 13 | 12⅞ |
| No. 1 Thin Latex Crepe | 16⅛ | 16¼ | 15⅞ | 15¾ | 15¾ | 15¾ | 15½ | 15½ | 15 | 14⅞ | 14⅝ | 14¾ | 14½ | 14⅝ | 14¾ | 15⅜ | .. | .. | 14⅞ | 15⅝ | 15 | 15 | 14⅞ | 14¾ |
| No. 1 Thick Latex Crepe | 16⅛ | 16⅛ | 15¾ | 15⅝ | 15⅝ | 15⅝ | 15⅛ | 15⅛ | 14⅞ | 14¾ | 14½ | 14⅝ | 14¾ | 14⅜ | 14⅝ | 15¼ | .. | .. | 14¾ | 15 | 14⅞ | 14⅞ | 14¾ | 14⅝ |
| No. 1 Brown Crepe | 12¾ | 12¾ | 12⅜ | 12⅜ | 12⅛ | 12⅛ | 11½ | 11¾ | 11¼ | 11⅜ | 11⅛ | 11¼ | 11⅜ | 11⅛ | 11⅜ | 12 | .. | .. | 11⅝ | 11⅞ | 11¾ | 11⅞ | 11¾ | 11⅝ |
| No. 2 Brown Crepe | 12½ | 12½ | 12¼ | 12¼ | 12 | 12 | 11¼ | 11½ | 11 | 11⅛ | 10⅞ | 11 | 11⅛ | 10⅞ | 11⅛ | 11¾ | .. | .. | 11⅜ | 11⅝ | 11½ | 11⅝ | 11½ | 11⅜ |
| No. 2 Amber | 12¾ | 12¾ | 12⅜ | 12⅜ | 12⅛ | 12⅛ | 11½ | 11¾ | 11¼ | 11⅜ | 11⅛ | 11¼ | 11⅜ | 11⅛ | 11⅜ | 12 | .. | .. | 11⅝ | 11⅞ | 11¾ | 11⅞ | 11¾ | 11⅝ |
| No. 3 Amber | 12½ | 12½ | 12¼ | 12¼ | 12 | 12 | 11¼ | 11½ | 11 | 11⅛ | 10⅞ | 11 | 11⅛ | 10⅞ | 11⅛ | 11¾ | .. | .. | 11⅜ | 11⅝ | 11½ | 11⅝ | 11½ | 11⅜ |
| No. 4 Amber | 12 | 12 | 11⅝ | 11⅝ | 11⅜ | 11⅜ | 10⅞ | 11 | 10⅜ | 10½ | 10¼ | 10⅜ | 10½ | 10¼ | 10½ | 11⅛ | .. | .. | 10¾ | 11 | 10⅞ | 11 | 11 | 10⅞ |
| Rolled Brown | 10 | 10 | 9¾ | 9⅞ | 9¾ | 9¾ | 9⅜ | 9½ | 9 | 9 | 8¾ | 8⅞ | 9 | 8¾ | 9 | 9⅝ | .. | .. | 9¼ | 9½ | 9⅜ | 9½ | 9⅜ | 9¼ |

* Holiday.

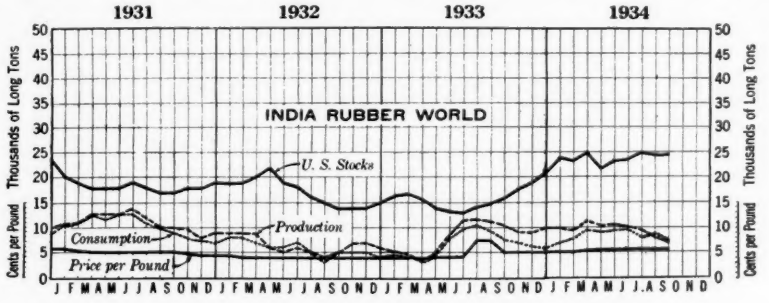
# RECLAIMED RUBBER

LAST month the intrinsic value of whole tire and inner tube reclaims in relation to crude rubber was pointed out on the basis of volume cost comparison. Mention was not made of the inevitable increase of costs under NRA that will further emphasize these economies as crude advances.

During the past month consumption of reclaim was distinctly curtailed by absence from the market of makers of battery boxes who normally account for about 1,200 tons monthly. Because of this fact the consumption ratio of reclaim to crude reported for September is misleading since with allowance made as above indicated the ratio actually increased in September over August, rather than decreased.

Reclaimers are continuing to manufacture to some extent for stock in anticipation of the battery box makers as well as for anticipated winter demands by other rubber manufacturing lines.

Quotations are firm, steady, and unchanged from last month.




Production, Consumption, Stocks, and Price of Tire Reclaim

## United States Reclaimed Rubber Statistics—Long Tons

| Year | Production | Consumption | Consumption Per Cent to Crude | United States Stocks* | Exports |
|---|---|---|---|---|---|
| 1931 | 132,462 | 125,001 | 35.7 | 19,257 | 6,971 |
| 1932 | 75,656 | 77,500 | 23.3 | 21,714 | 3,536 |
| 1933 | 99,974 | 81,612 | 20.1 | 20,746 | 3,583 |
| 1934 | | | | | |
| January | 9,828 | 7,000 | 17.3 | 24,303 | 333 |
| February | 9,504 | 7,646 | 18.8 | 23,356 | 282 |
| March | 11,479 | 9,683 | 20.3 | 25,113 | 354 |
| April | 10,185 | 9,387 | 20.9 | 22,033 | 394 |
| May | 10,848 | 9,500 | 22.1 | 22,887 | 559 |
| June | 10,820 | 9,459 | 23.5 | 23,664 | 444 |
| July | 9,446 | 8,175 | 25.0 | 24,926 | 669 |
| August | 8,160 | 8,493 | 25.5 | 24,607 | 410 |
| September | 6,974 | 7,024 | 23.1 | 24,540 | 307 |

*Stocks on hand the last of the month or year.
*Compiled by The Rubber Manufacturers Association, Inc.*

### New York Quotations

October 26, 1934

| | Spec. Grav. | Cents per Lb. |
|---|---|---|
| **High Tensile** | | |
| Super-reclaim, black | 1.20 | 8¼/9 |
| red | 1.20 | 7 /7¼ |
| **Auto Tire** | | |
| Black | 1.21 | 5 /5¼ |
| Black selected tires | 1.18 | 5¼/5½ |
| Dark gray | 1.35 | 6¼/6½ |
| White | 1.40 | 9¼/9½ |
| **Shoe** | | |
| Unwashed | 1.60 | 6½/6¾ |
| Washed | 1.50 | 8 /9 |
| **Tube** | | |
| No. 1 | 1.00 | 13 / |
| No. 2 | 1.10 | 7½/7¾ |
| **Truck Tire** | | |
| Truck tire, heavy gravity. | 1.55 | 5½/6 |
| Truck tire, light gravity.. | 1.40 | 6 /6¼ |
| **Miscellaneous** | | |
| Mechanical blends | 1.60 | 4¼/4½ |

## Laytex

LAYTEX, a new and revolutionary dielectric or insulation product, is announced by the manufacturer,[1] who claims that it possesses properties so superior to those of ordinary flexible dielectrics that in time all existing codes and specifications on wire insulation will have to be rewritten.

Laytex is derived directly from rubber latex. It is maintained in its natural liquid state until the very last manufacturing process, which converts it into a solid dielectric, perfectly and uniformly applied. It is a non-coagulated, non-milled dielectric, purified to remove proteins, sugars, and water solubles, and therefore is the possessor of unique physical and electrical characteristics.

The mechanical method of manufacture consists in passing a conductor vertically through a series of baths of latex so that with each dip a film of dielectric is deposited and solidified almost immediately. This action occurs on any given section or length of conductor before it comes in physical contact with any mechanical support, thus avoiding mechanical defects of other types of insulated wires. The results of this process of insulating are: perfect centering of conductor; uniform wall thickness of dielectric.

Laytex possesses unusual physical and electrical properties, as follows: tensile strength in pounds per square inch, 5,000; elongation at rupture, 750%; set, in 2-inch gage length, in inches, ¼.

The insulation resistance constant is more than twice as high as that of the best grade of rubber compound required by A.S.T.M. specifications. The relative specific inductive capacity is 2.5 and is lower than that of any known flexible dielectric. The amount of water or moisture absorbed by Laytex after soaking in water for 14 days is remarkably low.

Because of its natural physical and electrical properties, plus the unusual features of mechanical application, Laytex opens the way for: thinner but superior walls, electrically and physically; finished conductors, lighter in weight and smaller in bulk. In certain applications a reduction of 25% in the outside diameter and 50% in the weight of the conductor is effected.

Successful applications of Laytex have already been made during the development period in many fields. This dielectric has been thoroughly proved on emergency telephone wire, nonmetallic underground cables, portable cord, switchboard wire, blasting wire, shot-firing wire, seismograph instrument wire, vacuum cleaner wire, and radio wire.

[1] United States Rubber Co., New York, N. Y.

## British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for September, 1934:

Rubber Exports: Ocean shipments from Singapore, Penang, Malacca, and Port Swettenham

| | September, 1934 | |
|---|---|---|
| To | Sheet and Crepe Rubber Tons | Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons |
| United Kingdom | 17,837 | 325 |
| United States | 21,826 | 388 |
| Continent of Europe | 8,955 | 281 |
| British possessions | 4,552 | 86 |
| Japan | 5,884 | 13 |
| Other countries | 900 | 4 |
| Totals | 59,954 | 1,097 |

Rubber Imports: Actual, by Land and Sea

| | September, 1934 | |
|---|---|---|
| From | Dry Rubber Tons | Wet Rubber Tons |
| Sumatra | 2,041 | 5,833 |
| Dutch Borneo | 1,917 | 3,918 |
| Java and other Dutch Islands | 361 | 26 |
| Sarawak | 1,438 | ... |
| British Borneo | 351 | 19 |
| Burma | 100 | ... |
| Siam | 1,025 | 601 |
| French Indo-China | 93 | 61 |
| Other countries | 92 | 13 |
| Totals | 7,418 | 10,471 |

# COMPOUNDING INGREDIENTS

THE moderate manufacturing activity prevailing generally in the rubber industry, particularly in the tire and tube division, has kept the demand for ingredients down correspondingly. There is a steady call, however, for all the higher powered accelerators, the chemical specialties for age-resisting effect, and for high class plasticizing ingredients of which several are well known. A tendency upward is noted in the prices of compounding materials generally.

ACCELERATORS. Butyl zimate is introduced as a new and efficient accelerator for latex. It makes possible very high grade latex products with very low sulphur ratios. It is superior to ordinary or methyl zimate for latex work.

CARBON BLACK. As tire makers are well supplied with carbon black, demand for this material continues at the very moderate rate that has prevailed the past 3 months.

CLAY. The proposed advance of $1 per ton, effective November 1, finds consumers well supplied for the remainder of the year.

LITHARGE. Demand and prices hold steady. Consumption is only routine.

MINERAL RUBBER. This product is selling in good volume for cheap rubber goods.

TITANIUM PIGMENTS. These white pigments are still active. Producers are able now to supply this material, which promises ultimately to become the favorite white pigment for rubber work.

SOFTENERS AND PLASTICIZERS. These materials are in good demand as aids to conserve power, promote mixing, and facilitate processing generally, all of which have assumed new economic importance.

SOLVENTS, V. M. & P. This common solvent is holding firm in price although the demand is not broad.

THERMO-PLASTICIZER. Reogen, a new strong plasticizing material recently placed on the market, is especially effective for promoting the dispersion of carbon black in tire treads and facilitating the general processing of rubber.

ZINC OXIDE. The demand from makers of tires and other rubber goods has fallen off. Prices remain unchanged.

## New York Quotations

### October 26, 1934

**Prices Not Reported Will Be Supplied on Application**

| | | |
|---|---|---|
| **Abrasives** | | |
| Pumicestone, powdered | lb. | $0.01¾/$0.03½ |
| Rottenstone, domestic | lb. | .02½/ .05 |
| English | ton | |
| Silica, 15 | ton | |
| Tripoli | lb. | .02¼/ .03 |
| **Accelerators, Inorganic** | | |
| Lead, white, dry (bbls.) | lb. | .06½ |
| Lime, hydrated | ton | 20.00 |
| Litharge (commercial) | lb. | .06½ |
| Magnesia, calcined, heavy | lb. | .04 |
| carbonate | lb. | .06½/ .07 |
| **Accelerators, Organic** | | |
| A-1 | lb. | .21 / .25 |
| A-5-10 | lb. | .33 / .36 |
| A-7 | lb. | .53 / .65 |
| A-11 | lb. | .60 / .75 |
| A-16 | lb. | .55 / .65 |
| A-19 | lb. | .56 / .75 |
| A-32 | lb. | .70 / .80 |
| Accelerator 49 | lb. | .40 / .52 |
| 552 | lb. | |
| 808 | lb. | |
| 833 | lb. | |
| Acrin | lb. | |
| Aldehyde ammonia | lb. | |
| Altax | lb. | |
| Barak | lb. | |
| Beutene | lb. | |
| Butyl Zimate | lb. | |
| C.P.B. | lb. | |
| Captax | lb. | |
| Crylene | lb. | |
| D.B.A. | lb. | |
| D.B.X. | lb. | |
| Di-Esterex | lb. | |
| Di-Esterex-N | lb. | |
| DOTG | lb. | .44 / .57 |
| DPG | lb. | .35 / .47 |
| Esterex | lb. | |
| Ethylideneaniline | lb. | |
| Formaldehyde P.A.C. | lb. | |
| Formaldehydeaniline | lb. | |
| Formaldehyde-para-toluidine | lb. | |
| Guantal | lb. | .42 / .51 |
| Hepteen Base | lb. | |
| Hexamethylenetetramine | lb. | |
| Lead oleate, No. 999 | lb. | .11 |
| Witco | lb. | .11 |
| Lithex | lb. | |
| Methylenedianilide | lb. | |
| Monex | lb. | |
| Novex | lb. | |
| Pipsol X | lb. | 3.55 / 4.00 |
| Plastone | lb. | |
| R-2 | lb. | 1.55 / 1.90 |
| base | lb. | 4.55 / 5.00 |
| R & H 50-D | lb. | |
| Safex | lb. | |
| Super-sulphur No. 1 | lb. | |
| No. 2 | lb. | |
| Tepidone | lb. | |
| Tetrone A | lb. | |
| Thio | lb. | |
| Thiocarbanilide | lb. | |
| Thionex | lb. | |
| Trimene Base | lb. | |
| Triphenyl guanidine (TPG) | lb. | |
| Tuads | lb. | |
| Ureka | lb. | $0.62 /$1.00 |
| B | lb. | |
| C | lb. | .58 / .69 |
| Vulcanex | lb. | |
| Vulcanol | lb. | |
| Vulcone | lb. | |
| Z.B.X. | lb. | |
| Z-88-P | lb. | .48 / .60 |
| Zimate | lb. | |
| **Acids** | | |
| Acetic 28% (bbls.) | 100 lbs. | 2.53 / 2.78 |
| glacial (carboys) | 100 lbs. | 14.00 |
| Sulphuric, 66° | ton | 15.50 |
| **Age Resisters** | | |
| Age-Rite Gel | lb. | |
| HP | lb. | |
| powder | lb. | |
| resin | lb. | |
| white | lb. | |
| Akroflex | lb. | |
| Albasan | lb. | |
| Antox | lb. | |
| B.L.E. | lb. | |
| Flectol A | lb. | |
| B | lb. | |
| H | lb. | |
| White | lb. | |
| Hiflex A | lb. | |
| C | lb. | |
| M.U.F. | lb. | |
| Neozone (standard) | lb. | |
| A | lb. | |
| B | lb. | |
| C | lb. | |
| D | lb. | |
| E | lb. | |
| L | lb. | |
| Oxynone | lb. | |
| Parazone | lb. | |
| Permalux | lb. | |
| Solux | lb. | |
| V.G.B. | lb. | |
| Zalba | lb. | |
| **Alkalies** | | |
| Caustic soda, 50% liquid, Columbia | 100 lbs. | 2.25 |
| solid | 100 lbs. | 2.60 |
| **Antiscorch Materials** | | |
| Antiscorch T | lb. | |
| Retarder B | lb. | |
| W | lb. | |
| R. H. Cumar | lb. | .075 / .085 |
| U.T.B. | lb. | |
| **Antisun Materials** | | |
| Heliozone | lb. | |
| Sunproof | lb. | |
| **Binders, Fibrous** | | |
| Asbestos | ton | 30.00 |
| **Brake Lining Saturants** | | |
| B. R. C. No. 553 | lb. | .015 / .017 |
| B. R. T. No. 3 | lb. | .015 / .017 |
| **Colors** | | |
| **BLACK** | | |
| Bone (Quality Group No. 1) | lb. | $0.11½/$0.15½ |
| Lampblack (commercial) | lb. | .07 / .12 |
| **BLUE** | | |
| Brilliant | lb. | |
| Prussian | lb. | .35½ |
| Toners | lb. | .80 / 3.50 |
| Ultramarine, dry | lb. | .10 |
| **BROWN** | | |
| Mapico | lb. | .13 |
| Sienna, Italian, raw (Quality Group No. 1) | lb. | .12½ |
| **GREEN** | | |
| Brilliant | lb. | |
| Chrome, light | lb. | .20 |
| medium | lb. | .20 |
| oxide (delivered) | lb. | .21½ |
| Dark | lb. | |
| Guignet's | lb. | .70 |
| Light | lb. | |
| Toners | lb. | .85 / 3.50 |
| **ORANGE** | | |
| Lake | lb. | |
| Toners | lb. | .40 / 1.60 |
| **ORCHID** | | |
| Toners | lb. | 1.50 / 2.00 |
| **PINK** | | |
| Toners | lb. | 1.50 / 4.00 |
| **PURPLE** | | |
| Permanent | lb. | |
| Toners | lb. | .60 / 2.00 |
| **RED** | | |
| Antimony | | |
| Crimson, R. M. P. No. 3 | lb. | .46 |
| Sulphur free | lb. | .48 / .50 |
| Golden 15/17% | lb. | .23 |
| 7-A | lb. | .33 |
| Z-2 | lb. | .20 |
| Cadmium | lb. | .75 / .80 |
| Chinese | lb. | |
| Crimson | lb. | |
| Iron Oxides | | |
| Rub-Er-Red | lb. | .09¼ |
| Mapico | lb. | .09¼ |
| Medium | lb. | |
| Scarlet | lb. | |
| Toners | lb. | .80 / 2.00 |
| **WHITE** | | |
| Lithopone (bags) | lb. | .04½/ .04¾ |
| Albalith Black Label-11 | lb. | .04½/ .04¾ |
| Astrolith (5-ton lots) | lb. | .04½/ .04¾ |
| Azolith | lb. | .04½/ .04¾ |
| Cryptone-19 | lb. | .06 / .06¼ |
| CB-21 | lb. | .06 / .06¼ |
| Sunolith (5-ton lots) | lb. | .04½/ .04¾ |
| XX-20 Zinc Sulphide | lb. | .10½/ .10¾ |
| 86 | lb. | .10½/ .10¾ |
| Rayox | lb. | |
| Titanolith (5-ton lots) | lb. | .06 / .06¼ |
| Titanox-A | lb. | .17 / .18¾ |
| B | lb. | .06 / .06½ |
| C | lb. | .06 / .06½ |
| Ti-Tone | lb. | |

Zinc Oxide
Azo 35 (35% leaded)....lb. $0.05¾/$0.06
Z (10% leaded).....lb. .06¼/ .06½
ZZ (3-5% leaded).....lb. .06½/ .06¾
ZZZ (lead free).....lb. .06½/ .06¾
Black label (lead free)..lb. .06½
Cerematone .....lb. .06½/ .06¾
F. P. Florence, Green Seal-8 .....lb. .09⅜/ .09⅝
Red Seal-9 .....lb. .08⅜/ .08⅝
White Seal-7 (bbls.)..lb. .10⅝
Green label (lead free)..lb. .06½
seal, Anaconda .....lb. .09⅜/ .09⅝
Horsehead (lead free) brand
Special-3 .....lb. .06½/ .06¾
XX Red-4 .....lb. .06½/ .06¾
72 .....lb. .06½/ .06¾
78 .....lb. .06½/ .06¾
103 .....lb. .06½/ .06¾
Kadox Black Label-15....lb. .09⅜/ .09⅝
Blue Label-16 .....lb. .08⅜/ .08⅝
Red Label-17 .....lb. .07 / .07¼
Lead free, all grades
Anaconda .....lb. .06½/ .06¾
Leaded, 5%, Anaconda...lb. .06¼/ .06½
35%, Anaconda .....lb. .05¾/ .06
Red label (lead free)....lb. .06½
seal, Anaconda .....lb. .08⅜/ .08⅝
U.S.P. (bbls.).....lb. .12¼
U.S.P. X (bbls.) .....lb. .12½
White seal, Anaconda ..lb. .10⅜

YELLOW
Cadmium .....lb. .40 / .45
Lemon .....lb.
Mapico .....lb. .09½
Ocher, domestic (Quality Group A) .....lb. .02¾
Toners .....lb. 2.50

## Dispersing Agents
Bardex .....lb. .023 / .025
Bardol .....lb. .021 / .023
Darvan .....lb.
Sperzo .....lb.

## Factice—See Rubber Substitutes

## Fillers, Inert
Asbestine .....ton 15.00
Barytes, c.l. .....ton 22.20
f.o.b. St. Louis.....ton 23.00
off color, domestic.....ton 22.50 /25.00
white, imported .....ton 32.50 /35.00
Blanc fixe, dry precip....ton 70.00 /75.00
pulp, 66⅔% .....ton 42.50
Calcene .....100 lbs. 1.75
Infusorial earth .....lb. .03 / .05
Kalite No. 1 .....ton
No. 3.....ton
Suprex, white, extra light.ton
heavy .....ton 45.00 /60.00
Whiting
Chalk precipitated .....lb. .04¼/ .04¾
Columbia brand .....ton 8.00
Domestic .....ton
Hakuenka .....lb.
Paris white, English cliff-stone .....100 lbs.
Sussex .....ton
Witco .....ton 15.00
Wood flour (f.o.b. New Hampshire) .....ton

## Fillers for Pliability
Flex .....lb.
Fumonex, c.l., f.o.b. works, bags .....lb. .03
l.c.l., f.o.b. warehouse...lb. .05½/ .07
P-33 .....lb.
Thermax .....lb.
Velvetex .....lb.

## Finishes
IVCO lacquer, clear.....gal.
colors .....gal.
Rubber lacquer, clear.....gal.
Colored .....gal.
No. 106.....gal. 3.00
Starch, corn, pwd.....100 lbs. 3.46 / 3.66
potato .....lb. .05¼/ .06
Talc, dusting .....ton 20.00
Pyrax .....ton

## Flock
Cotton flock, dark.....lb. .10½/ .13
dyed .....lb. .50 / .85
white .....lb. .14 / .20
Rayon flock, colored .....lb. 1.60 / 1.75
white .....lb. 1.40

## Latex Compounding Ingredients
Aquarex A .....lb.
D .....lb.
F .....lb.
Aresco .....lb. .28 / .40
Butyl Zimate .....lb.
Casein, domestic (5-ton lots, delivered) .....lb. .10 / .10½
Catalpo .....ton
Colloidal sulphur .....lb.
zinc oxide .....lb.
Dispersaid .....lb. 1.50
Dispersed Antox .....lb.
color pastes .....lb.
factice compound .....lb. .35
Heliozone .....lb.
Emo, brown .....lb. .12
white .....lb. .12
Igepon A .....lb.
Latex disinfectant No. 2..lb.
Nekal BX (dry).....lb.
Palmol .....lb. $0.11
Vulcan colors .....lb.

## Mineral Rubber
B. R. C. No. 20.....lb. .014 /$0.016
Black Diamond .....ton 27.00
Genasco Hydrocarbon, granulated, (fact'y)...ton
solid .....ton
Gilsonite Hydrocarbon (factory) .....ton
Hydrocarbon, hard .....ton
soft .....ton
Parmr Grade 1 .....ton 23.00
Grade 2 .....ton 23.00
265° .....ton

## Mold Lubricants
Rusco mold paste .....lb. .12 / .30
Sericite .....ton 65.00
Soapbark (cut) .....lb. .11 / .12
Soapstone .....ton 15.00 /25.00

## Oils
Castor, blown, c.l., drums, returnable .....lb. .11½
Poppyseed (bbls.).....gal.
Rapeseed, refined (bbls.)..gal. .41

## Reclaiming Oils
B. R. V.....lb. .039 / .041
S. R. O.....lb. .012 / .014

## Reenforcers
Carbon Black
Aerfloted Arrow Specification Black .....lb. .0535/ .0825
Arrow Compact Black...lb.
Granulized Carbon Black .....b.
Century (delivered).....lb. .0445/ .0535
"Certified" Cabot .....lb.
Spheron .....lb.
Disperso (delivered).....lb. .0445/ .0535
Dixie, c.l., f.o.b., New Orleans, La.; Galveston or Houston, Tex.....lb. .0445
local stock, delivered..lb. .07 / .08¼
Gastex .....lb. .03 / .07
Kosmos, c.l., f.o.b., New Orleans, La.; Galveston or Houston, Tex.lb. .0445
local stock, delivered..lb. .07 / .08¼
Micronex .....lb. .0535
Beads .....lb.
Ordinary (compressed or uncompressed) .....lb. .0535
Carbonex .....lb. .030 / .0375
S .....lb. .0315/ .040
Clays
Aerfloted Paragon .....ton 7.50 /10.00
Suprex, No. 1, selected.ton 10.00
No. 2, standard.....ton 7.50
Blue Ridge, dark.....ton
China .....ton
Dixie .....ton
McNamee .....ton
Par .....ton
Perfection .....ton
Standard .....ton
Witco .....ton 8.50
Cumar EX .....lb. .0275/ .0375

## Reodorants
Amora A .....lb.
B .....lb.
C .....lb.
D .....lb.
Para-Dors .....lb.
Rodo No. 0.....lb.
No. 10 .....lb.

## Rubber Substitutes or Factice
Amberex .....lb. .13¾
Black .....lb. .06 / .08½
Brown .....lb. .07½/ .11½
Duphax A .....lb. .09¼
B .....lb. .09
Fac-Cel B .....lb. $0.13
C .....lb. .13
White .....lb. .07¼/$0.12

## Softeners
B. R. C. No. 555.....lb. .012 / .014
B. R. T. No. 7.....lb. .015 / .017
Burgundy pitch .....lb. .04 / .05
(net weight) .....lb. .06¼/ .08
Corn oil, crude (bbls.).....lb. .08
Cycline oil .....gal. .15 / .28
Fluxol .....ton
Genasco liquid asphalt....gal.
Hardwood pitch, c.l.....ton 23.50 /25.00
Palm oil (Witco) .....lb. .05
Petrolatum, light amber...lb. .04½
Pigmentar (drums) .....gal. .23 / .25
Pigmentaroil (drums) ...gal. .23 / .25
Pine oil, dest. distilled (drums) .....gal. .44 / .48
pitch .....bbl. 6.00
tar, specification retort (drums) .....gal. .23 / .29
Plastogen .....lb.
Reogen .....lb.
Rosin oil, compounded....gal. .34 / .40
Rubtack .....lb. .10
Sperso .....lb.
Tackol .....lb. .085 / .18
Tonox .....lb.
Witco No. 20.....gal. .15

## Softeners for Hard Rubber Compounding
RSL Resin .....lb.
Resin C-55° .....lb. .0125/ .0145
70° .....lb. .0125/ .0145
85° .....lb. .0125/ .0145

## Solvents
Benzol 90% (drums).....gal. .27
Bondogen .....gal.
Carbon bisulphide (drums).lb. .05¼/ .08½
tetrachloride .....lb. .05¼
Dipentene, commercial....gal. .34 / .43
Rubber (f.o.b. Group 3 refineries) .....gal.
Toluol .....gal. .38
Turpentine, steam distilled .....gal. .48
wood, dest. distilled (drums) .....gal. .41 / .44

## Stabilizers for Cure
Laurex, ton lots .....lb.
Stearex B .....lb. .08 / .09½
Beads .....lb. .08 / .12
Stearic acid, dbl. pres'd....lb. .09 / .14
single pressed .....lb. .08½/ .13
Zinc stearate .....lb. .20 / .25

## Synthetic Rubber
DuPrene Latex Type 50..gal.
Type D .....lb.
F .....lb.

## Tackifier
B. R. H. No. 2.....lb. .015 / .017

## Varnish
Shoe .....gal. 1.35

## Vulcanizing Ingredients
Sulphur
Chloride, drums .....lb. .03¼/ .04
Flowers, extrafine refined, U.S.P. ...100 lbs.
Rubber .....100 lbs. 1.95 / 2.80
Telloy .....lb.
Vandex .....lb.
(See also Colors—Antimony)

## Waxes
Carnauba, No. 3 chalky....lb. .20
2 N.C. .....lb.
3 N.C. .....lb. .23
1 Yellow .....lb. .38 / .40
2 .....lb. .37 / .38
Montan, crude .....lb. .10½
Paraffine (128/130) refined.lb. .06½

## U. S. Crude and Waste Rubber Imports for 1934

| | Plantations | Latex | Paras | Africans | Centrals | Guayule | Manicoba and Matto Grosso | Totals 1934 | Totals 1933 | Balata | Miscellaneous | Waste |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. .....tons | 44,988 | 973 | 182 | 61 | .. | .. | .. | 46,204 | 31,110 | 73 | 693 | 32 |
| Feb. ..... | 30,164 | 750 | 118 | .. | .. | .. | .. | 31,032 | 18,875 | 70 | 607 | .. |
| Mar. ..... | 43,204 | 901 | 450 | .. | .. | 50 | .. | 44,605 | 27,879 | 169 | 415 | 157 |
| Apr. ..... | 44,394 | 827 | 324 | .. | 17 | 100 | .. | 45,662 | 19,459 | 165 | 633 | 99 |
| May ..... | 46,440 | 1,230 | 181 | .. | 3 | 100 | .. | 47,954 | 27,556 | 143 | 616 | 117 |
| June ..... | 48,275 | 1,235 | 115 | .. | 8 | 50 | .. | 49,683 | 22,729 | 128 | 553 | 27 |
| July ..... | 40,217 | 1,064 | 210 | 35 | 4 | .. | .. | 41,530 | 44,290 | 107 | 561 | 55 |
| Aug. ..... | 31,971 | 1,022 | 145 | 10 | .. | 100 | .. | 33,248 | 44,802 | 67 | 672 | 84 |
| Sept. ..... | 27,583 | 912 | 308 | 30 | 2 | .. | .. | 28,835 | 47,352 | 75 | 420 | 39 |
| Total, 9 mos., 1934.....tons | 357,236 | 8,914 | 2,033 | 136 | 34 | 400 | .. | 368,753 | ..... | 997 | 5,170 | 610 |
| Total, 9 mos., 1933.....tons | 275,392 | 5,443 | 3,182 | 35 | .. | .. | .. | ..... | 284,052 | 1,100 | 6,063 | 9[illegible] |

*Compiled from The Rubber Manufacturers Association, Inc., statistics.*

# are YOU open to conviction?

## Here's your chance to put the WHOLE line of WITCO pigments to the test!

**WITCO stands squarely behind this line of pigments. We know that they conform to the highest standards of purity and uniformity. That's why we are making this offer . . . giving you this practical opportunity to *compare* WITCO pigments with any other line of pigments—or any other combination of pigments you have been using!**

**We will make it as easy as possible for you to perform this test. We will arrange for you to receive samples of WITCO pigments—a complete batch necessary for a run with your formula. Make your product with these WITCO pigments. Compare it with the same product made with other pigments. We are confident that you will be more than pleased with the results you obtain from the WITCO line. Here is your opportunity to give the *complete* line of WITCO pigments a fair trial . . . to let them speak for themselves in the quality of your finished product. If you need technical assistance in making this test, we will gladly supply it.**

**Write today, giving us the quantity of each item you need to make this interesting comparison. Samples will be sent without delay.**

**Each of these products conforms to the WITCO tradition of quality:**

**DISPERSO CARBON BLACK**—A specially-produced Carbon Black which gives better dispersion. It is double-checked daily, with two independent tensile tests; one at the plant where Disperso is made, another at our general research laboratories. We will meet (or better!) the most exacting specifications for Carbon Black.

**WITCO CLAY**—A light, fluffy Clay of good color and low oil absorption.

**WITCO WHITING**—Precipitated or natural. Clear, transparent Calcium Carbonate crystals. Mesh to meet your specifications. Color exceedingly white in dry form, and clean transparency when under oil.

**WITCO BLANC FIXE**—Direct and indirect process. Special grades for every purpose. All grades neutral.

**WITCO BARYTES**—Dry ground—several grades of extra fine grinding. Color from snow white to gray. All grades have high Barium Sulphate content and suitable for rubber and dark paints.

**WITCO MAGNESIA CARBONATE**—A uniform product of the traditional WITCO quality.

**WITCO MICA**—Water and Dry ground. Proper results depend on the mesh. We stock all grindings to meet specifications.

**WITCO STEARITE**—Excellent substitute for Stearic Acid for the rubber manufacturers.

**PIONEER HYDROCARBON (M. R.)**—The highest quality in both solid and granular grades . . . with melting points ranging from 200°C to 320°C to meet your most rigid requirements.

**PIONEER SULPHUR**—A uniform product meeting standard specifications.

# WITCO

## WISHNICK-TUMPEER, INC.

MANUFACTURERS AND IMPORTERS

CHICAGO, 365 E. ILLINOIS STREET NEW YORK, 251 FRONT STREET
BOSTON, 141 MILK STREET CLEVELAND, 616 ST. CLAIR AVENUE, N. E.

WITCO OWNED AND OPERATED: CENTURY CARBON CO., THE PIONEER ASPHALT CO. and the PANHANDLE CARBON CO.

**BUY DIRECT AND PROFIT DIRECTLY**

# COTTON AND FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

| Futures | Sept. 1 | Sept. 29 | Oct. 6 | Oct. 13 | Oct. 20 |
|---|---|---|---|---|---|
| Oct. ... | 13.16 | 12.42 | 12.08 | 12.24 | 12.21 |
| Nov. ... | .... | 12.47 | 12.12 | 12.28 | 12.24 |
| Dec. ... | 13.28 | 12.52 | 12.17 | 12.33 | 12.38 |
| Jan. ... | 13.32 | 12.56 | 12.24 | 12.37 | 12.32 |
| Mar. ... | 13.32 | 12.66 | 12.32 | 12.44 | 12.38 |
| May ... | 13.38 | 12.74 | 12.36 | 12.48 | 12.42 |
| July ... | 13.45 | 12.79 | 12.41 | 12.53 | 12.45 |

THE above table gives the first and last week-end closing prices of the month previous to that under review, also the week-end closing prices of each week of this review. This plan permits tracing at a glance the prices on each future for approximately 2 consecutive months.

Week ended October 6. Cotton futures declined to new lows. Uncertainty as to the ultimate effect of the Government's pool on export trade, apprehension that portions of the pool might be released for sale, hedge selling, and prospects of increasing crop forecasts were the principal factors responsible for the apathetic market.

Week ended October 13. This trading period was short because the Cotton Exchange closed Columbus Day, but resumed trading Saturday.

The Department of Agriculture's Crop Reporting Board released its October 1 forecast of 9,443,000 bales, an increase from the September 1 estimate of 9,252,000. Mr. McFadden, president of the Cotton Exchange, with representatives from 3 other exchanges, appealed to the Internal Revenue Bureau to modify the tax on foreign profits, a condition that has driven foreign trading from our markets and revenues from the Government. Another meeting is docketed at an early date for a more detailed presentation of the detrimental effects of such taxes. Prices dropped to the lowest levels since the recession movement during this period, but recovered sharply on renewal of inflation rumors, and intimations that the Government might decide to vary the 12¢ loan policy to avoid having the entire crop thrown in its lap.

Week ended October 20. Trading was characterized by dullness and fluctuations over a relatively narrow range. The period started lower than the previous close, but closed with the irregular net of from 8 points loss to 5 points gain. Most of the news centered about the Government's assurance that the A.A.A.'s crop adjustment program would be extended to cover the 1935 season. Details will not be ready for release until December 1. This program will have no relation to the Bankhead Cotton Marketing Act, which may or may not be operative next year. Full consideration is being taken of domestic and export consumption data, according to A.A.A. officials.

The Exchange Service estimates that the world supply including carry-over will be 38,790,000 bales, a decrease of 2,792,000 from last season. The American crop and carry-over represents a reduction of 4,500,000 bales. It is also reported that production of cotton mills recovered quickly after the strike and has been going during this month at the highest rate since May. The level of activity in this industry is somewhat higher than in general manufacturing.

Exceptionally small volume started the week of October 22, with 2 to 4 points off the previous week-end close. Most cotton apparently was still finding its way to the Government's 12¢ plan rather than to the market. Wednesday brought the best advance the cotton market has experienced for some time, with a recovery of 13 to 17 points. New buying as well as short covering came in anticipation of what the President might say in his address to the bankers, and knowledge that the Secretary of Agriculture realizes the importance of cotton exports. Exports since August 1 this year have been 978,593 bales less than the same period in 1933.

September, 1935, came into trading at 12.35¢, 10 points under July and only 4 points over December. This condition points to what could be expected when October, 1935, started selling Friday.

October 24 closing prices were: October 12.35¢, November 12.36, December 12.39, January 12.42, March 12.46, May 12.51, July 12.53, and September 12.45.

October 25 prices dipped as sales hit rise. Losses were 9 to 11 points.

### Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. During the past month cotton receded from substantially 13¢ for futures to basis of 12⅜¢ on October 25. Actual cotton is at a premium of 75 to 100 points over futures. This decline of futures, while the basis for actual cotton is rising, creates hesitation among fabric buyers. Many identified with the trading interests have laid down round contracts covering their requirements over the next 5 or 6 months. Fabric producers find a scarcity of actual cotton, and the prices asked for raw material are out of line with even the best prices securable for select makes of fabric.

The natural tendency of fabric markets over the next 4 weeks should be in the direction of more active trading. Textile interests are hopeful that artificial restraints will not change the usual history of the last quarter year.

RAINCOAT FABRICS. All raincoat manufacturers report very good business for the fall season. Suede is popular, and a novelty printed plaid for children's raincoats is selling well for the Christmas trade.

SHEETINGS. The recent considerable expansion in sales in October resulted in sufficient orders more than to take care of current production. Because buyers are not able to obtain spot cotton from the farmers, a large premium is now being placed upon cotton. Farmers are putting their cotton into government loan rather than selling on the basis of the present market. The manufacturer is therefore unable to obtain a satisfactory price for finished cloth based on present market prices. The price trend certainly points upward, and a firm market may be expected for the next 30 days or until the consumer demand is such that prices can be advanced above the present unsatisfactory levels.

TIRE FABRICS. Demand is moderate and seasonal. Prices are nominal, steady, and unchanged.

**WEEKLY AVERAGE PRICES OF MIDDLING COTTON**

| Week Ended | Cents per Pound |
|---|---|
| Sept. 29 | 12.70 |
| Oct. 6 | 12.44 |
| Oct. 13 | 12.44 |
| Oct. 20 | 12.54 |

## New York Quotations

### October 26, 1934

| | |
|---|---|
| **Drills** | |
| 38-inch 2.00-yard ..... *yd.* | $0.16¼ |
| 40-inch 3.47-yard ..... | .09⅝ |
| 50-inch 1.52-yard ..... | .21⅝ |
| 52-inch 1.85-yard ..... | .17¾ |
| **Ducks** | |
| 38-inch 2.00-yard D. F..... *yd.* | .16¼ |
| 40-inch 1.45-yard S. F..... | .22 |
| 72-inch 1.05-yard D. F..... | .31¾ |
| 72-inch 17.21-ounce ..... | .35½ |
| **MECHANICALS** | |
| Hose and belting..... *lb.* | .35 |
| **TENNIS** | |
| 52-inch 1.35-yard ..... *yd.* | .24 |
| ***Hollands** | |
| **GOLD SEAL** | |
| 30-inch No. 72..... *yd.* | .19½ |
| 40-inch No. 72..... | .21½ |
| **RED SEAL** | |
| 30-inch ..... *yd.* | .17 |
| 40-inch ..... | .18½ |
| 50-inch ..... | .24¼ |
| **Osnaburgs** | |
| 40-inch 2.34-yard ..... *yd.* | .14 |
| 40-inch 3.00-yard ..... | .10⅝ |
| 40-inch 10-ounce part waste..... | .15⅝ |
| 37-inch 2.42-yard ..... | .13 |
| **Raincoat Fabrics** | |
| **COTTON** | |
| Bombazine 60 x 64..... *yd.* | .10½ |
| Plaids 60 x 48..... | .11¾ |
| Surface prints 60 x 64..... | .12¼ |
| Print cloth, 38½-inch, 60 x 64..... | .07⅛ |
| **SHEETINGS, 40-INCH** | |
| 48 x 48, 2.50-yard..... *yd.* | .11¾ |
| 64 x 68, 3.15-yard..... | .10⅝ |
| 56 x 60, 3.60-yard..... | .09⅛ |
| 44 x 48, 3.75-yard..... | .07¼ |
| **SHEETINGS, 36-INCH** | |
| 48 x 48, 5.00-yard..... *yd.* | .06⅛ |
| 44 x 40, 6.15-yard..... | .05 |
| **Tire Fabrics** | |
| **BUILDER** | |
| 17¼ ounce 60" 23/11 ply Karded peeler ..... *lb.* | .41 |
| **CHAFER** | |
| 14 ounce 60" 20/8 ply Karded peeler ..... *lb.* | .41 |
| 9¼ ounce 60" 10/2 ply Karded peeler ..... *lb.* | .41 |
| **CORD FABRICS** | |
| 23/5/3 Karded peeler, 1 1/32" cotton.. *lb.* | .41 |
| 15/3/3 Karded peeler, 1 1/32" cotton.. *lb.* | .39 |
| 23/5/3 Karded peeler, 1¼" cotton.. *lb.* | .48 |
| 23/5/3 Combed Egyptian..... *lb.* | .55 |
| **LENO BREAKER** | |
| 8¼ ounce and 10¼ ounce 60" Karded peeler ..... *lb.* | .36 |

*Prices for 1,200 yards of a width or over.

# Editor's Book Table

## NEW PUBLICATIONS

***The Vanderbilt News.*** R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. The September-October issue of this publication is of exceptionally timely interest, evidenced by the fact that a supplementary edition of 1,000 was required to meet the request for copies. The issue is devoted to latex compounding in its various phases, such as the use of a new dispersing material and its outstanding value in latex work; latex mixings, test films, acceleration, and aging protection. Technical data on latex are assembled in concise form for ready reference. The principal commercial applications of compounded latex are listed, and practical observations are directed to those contemplating using latex. The manufacture and the use of water dispersions of crude and reclaimed rubber are outlined.

**"The New Model A. W. Graphic Instrument."** Catalog No. 434. The Esterline-Angus Co., Indianapolis, Ind. This well-illustrated catalog is practically a textbook on the construction and the application of an advanced line of electrical graphic instruments for the control of important processes. Instrument supplies are listed and illustrated. The book is well indexed for easy reference on the part of engineers.

**"Heat and Sound Insulation."** This paper by E. J. Kvet, technical superintendent, Baldwin Rubber Co., Pontiac, Mich., illustrates and describes a laboratory apparatus devised by the author to determine the relative insulating characteristics of certain materials suitable for use as pads or backing on or under mats in motor cars.

**"The Future of Rubber:** Whither and How?" By C. F. Dawn. Published by Walter Jenn, Ltd., 203 Great College St., London, N.W.1, England. 1934. This candid analysis of the Campbell Scheme for the restriction of plantation rubber exports is in support of the assumption of the ultimate failure of this scheme like that of its predecessor, the Stevenson Scheme.

**"Sylphon Temperature and Pressure Control Catalog."** Fulton Sylphon Co., Knoxville, Tenn. This publication will be valued by plant engineers in the process industries for its complete description, data, and illustrations of the sylphon bellows line of appliances for temperature and pressure control. The catalog comprises a collection of 8 bulletins and a complete table of contents.

## BOOK REVIEWS

**"Chemical Engineering Catalog."** Nineteenth annual edition, 1934. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York, N. Y. Cloth, 779 pages, 9 by 12 inches. Illustrated. Indexed.

The latest edition of this standard reference work contains authoritative data regarding the products of several hundred concerns manufacturing engineering equipment and supplies for chemical and related industries including rubber. The volume comprises the following sections: Alphabetical Index; Trade Name Index; Classified Index of Equipment and Supplies; Equipment and Supplies Section; Classified Index of Chemicals and Raw Materials, Industrial Chemicals, Laboratory and Reagent Chemicals; Chemicals and Raw Materials Section; and Technical and Scientific Books Section.

**"Handbook of Chemistry and Physics.** Nineteenth Edition, 1934. Charles D. Hodgman, Editor in Chief. Published by Chemical Rubber Publishing Co., Cleveland, O. Flexible leather binding, 1,934 pages, 4¾ by 6¾ inches. Price $6.

Twenty-one years of carefully chosen additions and intelligently arranged revisions have established this handbook as a most authentic requisite for those engaged in chemical engineering or physical technique, whether of commercial, educational, or research laboratory application.

This Deluxe Edition has 95 additional pages of new tables covering properties of matter, physical constants, heat, light, X-ray crystallographic data, and mathematics; while 89 additional pages are required for revising, amplifying, and bringing up to date many tables that appeared in the previous edition. Aside from the time-saving mathematical and miscellaneous routine reference tables, the rubber technologists will undoubtedly find much to be desired in the 956 pages of chemical tables and physical constants of 4,000 organic compounds, and a like number of inorganic and metal-organic ones; the 44 pages on properties of matter; the 43 pages of new X-ray crystallographic data, etc.

The facility of use has been enhanced by dividing the book into 5 approximately equal sections, each bounded by a stiff colored paper insert on which appears a summary of contents for that particular section. This supplements the table of contents in the front and the new 28-page cross index in the back of the book, which should be on the desk of every rubber technologist.

## RUBBER BIBLIOGRAPHY

DuPrene Forges Ahead. E. R. Bridgwater, *Du Pont Magazine*, Nov., 1934, pp. 3, 4, 24.

Variations in the Composition of Latex from Clone and Seedling Rubber. J. L. Wiltshire, Bulletin No. 5, 61 pages, charts, and bibliography; Rubber Research Institute of Malaya.

Uses and Control of Natural Undergrowth on Rubber Estates. W. B. Haines, Planting Manual No. 6, 23 pages, Rubber Research Institute of Malaya.

Determining Flex Cracking in Tire Treads. H. Gray, H. S. Karch, and R. J. Hull, *Ind. Eng. Chem. (Anal.)*, 6, 265-67 (1934).

Manufacture of Sheet Rubber without Milling. F. H. Faithful, *Bull. Rubber Growers' Assocn.*, Sept., 1934, pp. 535-37.

Ultra-Violet Analysis in the Rubber Industry. H. Barron, *Rubber Age (London)*, Oct., 1934, pp. 219-22.

Formation of Sulphur from Hydrogen Sulphide and Sulphur Dioxide. Peachy Vulcanization Process. S. Reiner, *Kautschuk*, 10, 128 (1934).

Nature of Action of Organic Accelerators for Rubber Vulcanization. X. Action of Organic Acids on Rubber Sols. K. Shimada, *J. Soc. Chem. Ind. (Japan)*, 37, 309-310B (1934).

Mechanism of Acceleration of Vulcanization by Thiazols According to Patent Literature. R. Ditmar, *Caoutchouc & gutta-percha*, Sept. 15, 1934, pp. 16891-93. (To be continued.)

Obtaining Chlorinated Rubber with Latex as Base. A. D. Luttringer, *Caoutchouc & gutta-percha*, Sept. 15, 1934, pp. 16893-94. (Conclusion.)

Development and Progress of the Chemistry and Technology of Latex and Rubber in 1932/33. St. Reiner and O. Dudlitz, *Caoutchouc & gutta-percha*, Sept. 15, 1934, pp. 16894-96. (To be continued.)

Toxicity of Certain Organic Solvents. *Caoutchouc & gutta-percha*, Sept. 15, 1934, pp. 16897-98.

The Most Economical Steam Pressure for Curing. M. Praetorius, *Caoutchouc & gutta-percha*, Sept. 15, 1934, pp. 16898-900. (From *Die Waerme.*) (To be continued.)

Technical Problems of Rubber Reclaiming. P. Alexander, *Kautschuk*, Sept., 1934, pp. 133-39.

Making Compounds. J. and A. Talalay, *Kautschuk*, Sept., 1934, pp. 139-42. (To be continued.)

Rubber Latex vs. Rubber for Textiles. F. C. Pratt, *Rayon & Melliand Textile Monthly*, Oct., 1934, p. 499.

# CLASSIFIED ADVERTISEMENTS

**ALL CLASSIFIED ADVERTISING MUST BE PAID IN ADVANCE**

| GENERAL RATES | SITUATIONS WANTED RATES | SITUATIONS OPEN RATES |
|---|---|---|
| Light face type $1.00 per line (ten words) | Light face type 40c per line (ten words) | Light face type 75c per line (ten words) |
| Bold face type $1.25 per line (eight words) | Bold face type 55c per line (eight words) | Bold face type $1.00 per line (eight words) |

*Allow nine words for keyed address.* *Replies forwarded without charge.*

## SITUATIONS WANTED

WANTED: POSITION AS SUPERVISOR. PRACTICAL EXPERIence producing calendered clothing, auto top material, leatherette, calftex, suede cloth, rubberizing, compounding, milling, and calendering all gum stocks, having held similar position. Address Box No. 426, care of INDIA RUBBER WORLD.

CHEMICAL ENGINEER, 12 YEARS' EXPERIENCE IN TIRE AND mechanical goods compounding, development, research, factory control, and processing problems. Can manage help. Present employed, desires change. Address Box No. 427, care of INDIA RUBBER WORLD.

SUPERINTENDENT OR FACTORY MANAGER, WITH 14 YEARS' experience in the production of tires, tubes, mechanicals, and press goods, hose, belting, oil resisting stocks, and rubber covered rolls; also hard rubber, sponge rubber, composition soles, and tubing machine products. A producer who can handle help. Unqualified references as to ability and character. Address Box No. 428, care of INDIA RUBBER WORLD.

**GRADUATE: AGE 25 YEARS, HAVING 4 YEARS' experience handling latex; capable of analyzing and compounding latex cements, desires position. Address Box No. 429, care of INDIA RUBBER WORLD.**

EXPERIENCED RUBBER CHEMIST DESIRES POSITION AS development and production man. Successful experience includes suede, leatherette, upholstery, auto topping, and lacquered rubber fabrics. Have knowledge of latex compounding and procedures for manufacture of latex garments and associated products; also fundamentals of artificial leather coatings. Address Box No. 432, care of INDIA RUBBER WORLD.

EXAMINER OF CRUDE RUBBER. EXPERT. 18 YEARS' EXERIence. Handle labor. Address Box No. 433, care of INDIA RUBBER WORLD.

RUBBER CHEMIST, WITH 9 YEARS' LABORATORY AND FACtory experience and 8 years as sales executive, desires position. Qualified to organize and manage a rubber chemical sales department. Address Box No. 434, care of INDIA RUBBER WORLD.

SUPERINTENDENT, 18 YEARS' EXPERIENCE MANUFACTURING mechanicals, hard and soft rubber molded goods, tubes, and extruded products. Now employed, desires change. Best of references. Address Box No. 436, care of INDIA RUBBER WORLD.

## SITUATIONS OPEN

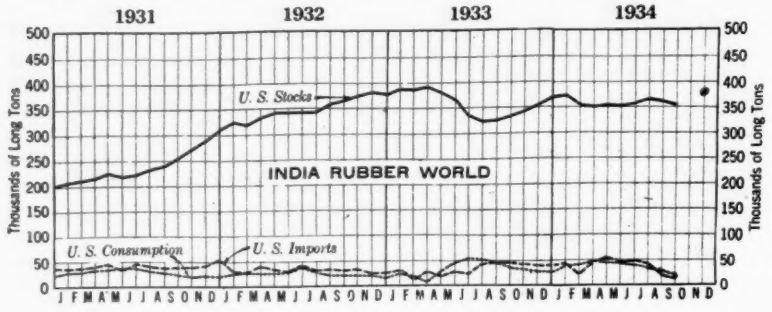
WANTED: RUBBER CHEMIST OR COMPOUNDER, FAMILIAR with formulating and compounding of dental rubbers. For advisory work. Address Box No. 430, care of INDIA RUBBER WORLD.

OLD AMERICAN FIRM DESIRES MAN ABLE TO INSTALL AND operate sponge rubber department. Essential to have full knowledge of compounds, equipment and processes for the production of sheet and mechanical molded sponge rubber. Chemical knowledge desirable. In first letter, give full qualifications and salary desired. Replies will be held strictly confidential, and our organization has been informed of this advertisement. Address Box No. 431, care of INDIA RUBBER WORLD.



(*Advertisements continued on page 77*)

## IMPORTS, CONSUMPTION, AND STOCKS




United States Stocks, Imports and Consumption

### United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

| Twelve Months | U. S. Net Imports* Tons | U. S. Consumption Tons | U. S. Stocks on Hand† Tons | U. S. Stocks Afloat† Tons | United Kingdom Stocks†‡ Tons | Singapore and Penang, Etc., Stocks†‡ Tons | World Production (Net Exports)‡ Tons | World Consumption Estimated‡ Tons | World Stocks†‡‖ Tons |
|---|---|---|---|---|---|---|---|---|---|
| 1931 ..... | 495,163 | 348,986 | 322,825 | 40,455 | 127,103 | 55,458 | 797,441 | 668,660 | 495,724 |
| 1932 ..... | 400,787 | 332,000 | 379,000 | 38,360 | 92,567 | 36,802 | 709,840 | 670,250 | 518,187 |
| 1933 ..... | 411,615 | 405,687 | 364,541 | 55,606 | 86,438 | 48,744 | 845,291 | 818,370 | 489,029 |
| 1934 | | | | | | | | | |
| January ... | 46,204 | 40,413 | 368,660 | 45,768 | 90,272 | 51,427 | 81,487 | 77,200 | 510,359 |
| February .. | 31,032 | 40,609 | 357,094 | 53,063 | 92,482 | 52,580 | 88,239 | 82,100 | 502,155 |
| March ..... | 44,605 | 47,097 | 353,242 | 54,722 | 94,314 | 59,224 | 92,070 | 78,000 | 506,494 |
| April ..... | 45,662 | 44,947 | 351,981 | 56,251 | 96,108 | 63,381 | 84,153 | 88,400 | 508,795 |
| May ..... | 47,954 | 43,012 | 351,329 | 57,921 | 96,197 | 89,758 | 115,612 | 79,300 | 537,278 |
| June ..... | 49,683 | 40,241 | 358,149 | 46,698 | 99,702 | 82,333 | 70,250 | 75,000 | 540,183 |
| July ..... | 41,530 | 32,647 | 364,883 | 45,869 | 105,904 | 76,417 | 73,279 | 69,100 | 547,204 |
| August .... | 33,248 | 33,310 | 362,647 | 40,278 | 105,199 | 77,100 | 75,093 | 79,500 | 544,944 |
| September . | 28,835 | 30,352 | 359,667 | 38,831 | ..... | ..... | ..... | ..... | ..... |

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. ‖Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

CRUDE rubber consumption by United States manufacturers for September totaled 30,352 long tons, against 33,310 long tons for August, a decrease of 8.9% under August and 14.0% below September, 1933, according to R.M.A. statistics. Consumption for September, 1933, was 35,281 (revised) long tons.

Crude rubber imports for September were 28,835 long tons, a decrease of 13.3% under August and 39.1% below September, 1933.

The estimated total domestic stocks of crude rubber on hand September 30 were 359,667 long tons, compared with August 31 stocks of 362,647 long tons. September 30 stocks decreased less than 1% below August 31 stocks, but were 6.6% above stocks of September 30, 1933.

Crude rubber afloat for the United States ports on September 30 was 38,831 long tons, against 40,278 long tons afloat on August 31 and 54,525 long tons afloat on September 30, 1933.

#### London and Liverpool Stocks

| Week Ended | Tons London | Tons Liverpool |
|---|---|---|
| Sept. 29..... | 56,030 | 57,477 |
| Oct. 6..... | 57,272 | 54,944 |
| Oct. 13..... | 59,469 | 55,266 |
| Oct. 20..... | 61,043 | 57,414 |
| Oct. 27..... | 62,058 | 57,944 |

## RUBBER SCRAP

THE demand for rubber scrap has regained moderate proportions, but reclaimers are well stocked and marking time.

BOOTS AND SHOES. The general tone of the market is good, and demand steady.

INNER TUBES. A very steady demand prevails. The high prices for crude rubber are influencing scrap collectors to hold their stocks for better prices to come later.

TIRES. The call for tires is fair. Dealers' stocks are ample at present. Prices will probably increase as winter cold and snows hinder collecting, particularly as the prevailing low prices and high freight rates act to limit accumulations by collectors.

SOLID TIRES. Export trade in solid tire scrap continues good. The supply, however, is steadily lessening owing to compulsory limitation of the use of solids because of the damage they inflict on the roads.

MECHANICALS. All grades of mechanical rubber scrap are in steady demand at prices unchanged from those of a month ago.

HARD RUBBER. The demand for this specialty is small. Prices are steady and unchanged.

#### CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

October 26, 1934

| | Prices |
|---|---|
| **Boots and Shoes** | |
| Boots and shoes, black....*lb.* | $0.01⅛/$0.01¼ |
| Colored .....*lb.* | .00⅞/ .01 |
| Untrimmed arctics .....*lb.* | .00⅞/ .01 |
| **Inner Tubes** | |
| No. 1, floating.....*lb.* | .07 / .07¼ |
| No. 2, compound.....*lb.* | .03¾/ .03⅞ |
| Red .....*lb.* | .02⅝/ .02¾ |
| Mixed tubes .....*lb.* | .03 / .03¼ |
| **Tires (Akron District)** | |
| Pneumatic Standard | |
| Mixed auto tires with beads .....*ton* | 9.50 / 9.75 |
| Beadless .....*ton* | 17.00 /17.50 |
| Auto tire carcass.....*ton* | 10.00 /10.50 |
| Black auto peelings.....*ton* | 20.00 /21.00 |
| Solid | |
| Clean mixed truck.....*ton* | 35.00 /37.50 |
| Light gravity .....*ton* | 37.50 /40.00 |
| **Mechanicals** | |
| Mixed black scrap.....*lb.* | .01 / .01⅛ |
| Hose, air brake .....*ton* | 15.00 /16.00 |
| Garden, rubber covered.*ton* | 13.00 /13.50 |
| Steam and water, soft...*ton* | 13.00 /13.50 |
| No. 1 red.....*lb.* | .01⅞/ .02 |
| No. 2 red.....*lb.* | .01⅛/ .01¼ |
| White druggists' sundries..*lb.* | .02 / .02⅛ |
| Mechanical .....*lb.* | .01¼/ .01½ |
| **Hard Rubber** | |
| No. 1 hard rubber.....*lb.* | .10⅞/ .11½ |

## INTERESTING LETTERS

### Teach Tire Economy to the Public

TO THE EDITOR: The article in your September issue entitled "Retreading" was of great interest to us.

The statement, however, that the retreading industry is today filled to the point of saturation is erroneous. We are in close touch with the development of the retreading business; we find that the point of saturation is by no means reached as there are thousands of tires which could be retreaded annually, but are now being thrown away. . . .

Recent activities of the major rubber companies in establishing retreading departments in their company owned stores will greatly assist in the education of the public toward the economies of tires retreaded in the proper way. We also believe that during the next 2 years in view of a rising market on new tires more and more people will become retread minded, which fact will in turn mean the additional sale of retreading equipment. . . .

The so-called "Gyp" will no longer be able to obtain casings when our motoring public adopts the practice of having its tires retreaded by either independent dealers or tire manufacturers.

We suggest that consideration be given to a plan of more rapidly educating the public by national advertising, sponsored by all those interested in the industry.

AN EXCLUSIVE MANUFACTURER OF TIRE REPAIR MATERIALS

New York, N. Y.,
October 15, 1934.

## Classified Advertisements

Continued

### SITUATIONS OPEN—Continued

FOREMAN FOR PYROXYLIN COATING AND mixing. Must be well experienced. State full particulars. Address Box No. 437, care of INDIA RUBBER WORLD.

### BUSINESS OPPORTUNITIES

WE HAVE AVAILABLE SPACE AND PRINCIPAL MACHINES suitable for manufacture of specialty mechanical goods and wish to contact with a practical rubber man who has an established business and desires increased factory facilities. Address Box No. 435, care of INDIA RUBBER WORLD.



*(Advertisements continued on page 79)*

## Statement of "India Rubber World"

Statement of the ownership, management, circulation, etc., required by the Act of March 3, 1933, of INDIA RUBBER WORLD, published monthly at New York, N. Y., for October 1, 1934.

State of New York }
County of New York } ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared William M. Morse, who, having been duly sworn according to law, deposes and says that he is the Editor of INDIA RUBBER WORLD and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: publisher, Bill Bros. Publishing Corp., 420 Lexington Ave., New York, N. Y.; editor, William M. Morse, 420 Lexington Ave., New York, N. Y.; managing editor, William M. Morse, 420 Lexington Ave., New York, N. Y.; business manager, B. Brittain Wilson, 420 Lexington Ave., New York, N. Y.

2. That the owner is: Bill Bros. Publishing Corp., Caroline L. Bill, Raymond Bill, Edward Lyman Bill, Randolph Brown, J. B. Spillane, all located at 420 Lexington Ave., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1% or more of total amount of bonds, mortgages, or other securities are: None.

4. That the 2 paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said 2 paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

WILLIAM M. MORSE, EDITOR.

Sworn to and subscribed before me this 1st day of October, 1934.

[SEAL] WM. A. LOW.

Notary Public N. Y. Co. No. 573. Reg. No. 5L334. Certificate filed in Queens Co. No. 1091. (My commission expires March 30, 1935.)

## Rubber Questionnaire

*†First and ‡Second Quarters, 1934

Long Tons

| RECLAIMED RUBBER | Inventory at End of Quarters 1st Q. | 2nd Q. | Production 1st Q. | 2nd Q. | Shipments 1st Q. | 2nd Q. | Consumption 1st Q. | 2nd Q. |
|---|---|---|---|---|---|---|---|---|
| Reclaimers solely | 4,489 | 3,212 | 11,067 | 12,958 | 9,179 | 13,654 | .... | .... |
| Manufacturers who also reclaim | 6,261 | 6,234 | 17,576 | 18,569 | 7,336 | 9,232 | 9,362 | 10,283 |
| Other manufacturers | 7,620 | 9,628 | ..... | ..... | ..... | ..... | 11,191 | 12,174 |
| Totals | 18,370 | 19,074 | 28,643 | 31,527 | 16,515 | 22,886 | 20,553 | 22,457 |

Long Tons

| SCRAP RUBBER | Inventory 1st Q. | 2nd Q. | Consumption 1st Q. | 2nd Q. | Due on Contracts 1st Q. | 2nd Q. |
|---|---|---|---|---|---|---|
| Reclaimers solely | 30,133 | 35,289 | 13,358 | 16,887 | 8,984 | 7,135 |
| Manufacturers who also reclaim | 53,129 | 61,389 | 19,373 | 19,988 | 14,567 | 13,679 |
| Other manufacturers | 299 | 321 | ..... | ..... | 6 | 94 |
| Totals | 83,561 | 96,999 | 32,731 | 36,875 | 23,557 | 20,908 |

### Tons of Rubber Consumed in Rubber Products and Total Sales Value of Shipments

| PRODUCTS | Crude Rubber Consumed Long Tons 1st Q. | 2nd Q. | Total Sales Value of Shipments of Manufactured Rubber Products 1st Q. | 2nd Q. |
|---|---|---|---|---|
| Tires and Tire Sundries | | | | |
| All types pneumatic casings (except bicycle, airplane) | 78,724 | 78,701 | $57,521,000 | $80,465,000 |
| All types pneumatic tubes (except bicycle, airplane) | 11,943 | 12,485 | 7,797,000 | 11,206,000 |
| Bicycle tires including juvenile pneumatics (single tubes, casings, and tubes) | 421 | 558 | 476,000 | 666,000 |
| Airplane tires and tubes | 30 | 29 | 69,000 | 99,000 |
| Solid and cushion tires for highway transportation | 340 | 412 | 396,000 | 590,000 |
| All other solid and cushion tires | 113 | 127 | 274,000 | 333,000 |
| Tire sundries and repair materials | 1,450 | 2,215 | 2,184,000 | 3,045,000 |
| Totals | 93,021 | 94,527 | $68,717,000 | $96,404,000 |
| Other Rubber Products | | | | |
| Mechanical rubber goods | 9,344 | 9,696 | $21,729,000 | $23,209,000 |
| Boots and shoes | 5,352 | 4,566 | 11,803,000 | 6,127,000 |
| Insulated wire and cable compounds | 727 | 967 | § | § |
| Druggists' sundries, medical and surgical rubber goods | 871 | 953 | 1,619,000 | 1,339,000 |
| Stationers' rubber goods | 392 | 483 | 440,000 | 523,000 |
| Bathing apparel | 194 | 374 | 304,000 | 1,260,000 |
| Miscellaneous rubber sundries | 844 | 969 | 1,735,000 | 1,912,000 |
| Rubber clothing | 105 | 97 | 318,000 | 298,000 |
| Automobile fabrics | 270 | 272 | 978,000 | 965,000 |
| Other rubberized fabrics | 1,071 | 1,105 | 2,726,000 | 2,996,000 |
| Hard rubber goods | 461 | 494 | 1,912,000 | 1,974,000 |
| Heels and soles | 3,246 | 3,595 | 5,112,000 | 4,960,000 |
| Rubber flooring | 168 | 237 | 301,000 | 389,000 |
| Sponge rubber | 448 | 430 | 675,000 | 699,000 |
| Sporting goods, toys, and novelties | 514 | 646 | 1,122,000 | 2,340,000 |
| Totals | 24,007 | 24,884 | $50,774,000 | $48,991,000 |
| Grand totals—all products | 117,028 | 119,411 | $119,491,000 | $145,395,000 |

### Inventory of Rubber in the United States and Afloat

Long Tons

| | Crude Rubber on Hand 1st Q. | 2nd Q. | Crude Rubber Afloat 1st Q. | 2nd Q. |
|---|---|---|---|---|
| Manufacturers | 216,903 | 220,899 | 20,184 | 14,875 |
| Importers and dealers | 57,521 | 66,035 | 35,161 | 31,818 |
| Totals | 274,424 | 286,934 | 55,345 | 46,693 |

* Revision of figures published in INDIA RUBBER WORLD, July 1, 1934, p. 76.

† Number of manufacturers that reported data was 244; crude rubber importers and dealers, 40; reclaimers (solely), 5; total daily average number of employes on basis of third week of Jan., 1934, was 147,647.

It is estimated that the reported grand total crude rubber consumption is 92.5%; grand total sales value, 95%; grand total crude rubber inventory, 77.7%; afloat figures, unavailable; reclaimed rubber production, 100%; reclaimed rubber consumption, 84.5%; and reclaimed rubber inventory, 73% of the total of the entire industry.

‡ Number of rubber manufacturers that reported data was 244; crude rubber importers and dealers, 40; reclaimers (solely), 5; total daily average number of employes on basis of third week of Apr., 1934, was 157,531.

It is estimated that the reported grand total crude rubber consumption is 93%; grand total sales value, 95%; the grand total crude rubber inventory, 79.5%; afloat figures unavailable; the reclaimed rubber production, 100%; reclaimed consumption, 79.2%; and reclaimed inventory, 80.6% of the total of the entire industry.

§ Due to the difficulty of securing representative sales figures this item is discontinued for 1934.

*Compiled from statistics supplied by The Rubber Manufacturers Association, Inc.*

## United States Latex Imports

| Year | Pounds | Value |
|---|---|---|
| 1931 | 10,414,712 | $884,355 |
| 1932 | 11,388,156 | 601,999 |
| 1933 | 24,829,861 | 1,833,671 |
| 1934 | | |
| Jan. | 2,521,961 | $239,054 |
| Feb. | 1,983,210 | 193,732 |
| Mar. | 2,539,425 | 257,545 |
| Apr. | 2,988,131 | 321,390 |
| May | 3,151,740 | 368,642 |
| June | 3,266,318 | 421,317 |
| July | 2,757,167 | 385,733 |
| Aug. | 2,617,829 | 369,335 |

*Data from United States Department of Commerce, Washington, D. C.*

## Foreign Trade Information

*For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.*

| No. | COMMODITY | CITY AND COUNTRY |
|---|---|---|
| *7,684 | Rubber cookers and mixers for making rubber soles and heels | Bogota, Colombia |
| *7,694 | Carbon black | Stuttgart, Germany |
| *7,704 | Household gloves | Amsterdam, Netherlands |
| *7,758 | Rubber heel machinery | Guayaquil, Ecuador |
| *7,761 | Soap dishes, mats, and sink stoppers | Montreal, Canada |
| *7,789 | Golf balls and golf ball cores | Sydney, Australia |
| †7,797 | Balls, toys, and dolls | Mexico City, Mexico |
| †7,830 | Rubber chemicals, accelerators, and golden antimony sulphide | Prague, Czechoslovakia |
| †7,841 | Gasoline hose | Prague, Czechoslovakia |
| *7,844 | Heels, and sole rubber in sheets (adhesive coated and uncoated) | Rotterdam, Netherlands |

*Purchase. †Purchase and agency.

## Classified Advertisements

Continued

### MACHINERY AND SUPPLIES FOR SALE

FOR SALE: ONE 2-ROLL CALENDER 14 BY 14" BELTED TO motor; three Devine Vulcanizers, 5' by 11' long; one 18 by 54" Birmingham 4-roll Calender; one unused 18 by 30" heavy duty FARREL MILL, chain drive; complete line of W. & P. Mixers, Vacuum Shelf Driers, Calenders, Mills, Colloid Mills, Pebble Mills, Dough Mixers, Hydraulic Presses, Pumps, etc. Rebuilt, guaranteed. What machinery have you for sale? CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: VACUUM SHELF DRIERS, W & P MIXERS, CALenders, Mills, Hydraulic Presses, etc. We also buy your surplus equipment for cash. STEIN-BRILL CORP., 183 Varick St., New York, N. Y.

### MISCELLANEOUS

WE WILL PAY 25¢ EACH FOR PERFECT COPIES of the following numbers of INDIA RUBBER WORLD: January, June, July, August, September, October, all 1934. INDIA RUBBER WORLD, 420 Lexington Ave., New York, N. Y.

## Rims Approved by The Tire & Rim Association, Inc.

| Rim Size | 9 Mos., 1934 No. | % | 9 Mos., 1933 No. | % |
|---|---|---|---|---|
| **Low Pressure (1933)** | | | | |
| 15x5.00E | ..... | ... | 35,499 | 0.5 |
| 15x5.50E | 6,579 | 0.1 | 25,323 | 0.4 |
| 15x6.00E | 208 | 0.0 | ..... | ... |
| 16x3.50D | ..... | ... | 189 | 0.0 |
| 16x4.00D | 1,373,651 | 13.8 | 847,230 | 12.0 |
| 16x4.25D | 521,769 | 5.3 | ..... | ... |
| 16x4.50D | 577,610 | 5.8 | 98,637 | 1.4 |
| 16x5.00E | 50,063 | 0.5 | 968 | 0.0 |
| 16x5.50E | 14,201 | 0.2 | 187 | 0.0 |
| 16x6.00E | 49 | 0.0 | 621 | 0.0 |
| **(1934)** | | | | |
| 15x5.00F | 756 | 0.0 | ..... | ... |
| 16x4.00E | 58,894 | 0.6 | ..... | ... |
| 16x4.50E | 581,770 | 5.9 | 75,292 | 1.1 |
| 16x5.00F | 111,588 | 1.1 | 398 | 0.0 |
| 16x5.50F | 8,939 | 0.1 | 374 | 0.0 |
| **Drop Center (Regular)** | | | | |
| 17x3.00D | 789,700 | 8.0 | 635,593 | 9.0 |
| 17x3.25E | 862,827 | 8.7 | 1,226,282 | 17.4 |
| 17x3.62F | 2,014,100 | 20.3 | 1,196,202 | 17.0 |
| 17x4.00F | 39,805 | 0.4 | 216,235 | 3.1 |
| 17x4.19F | 6,960 | 0.1 | 29,931 | 0.4 |
| 18x2.15B | 20,062 | 0.2 | 22,858 | 0.3 |
| 18x3.00D | 19,641 | 0.2 | 749,893 | 10.6 |
| 18x3.25E | 84,380 | 0.9 | 121,631 | 1.7 |
| 18x3.62F | 338 | 0.0 | 1,697 | 0.0 |
| 18x4.00F | 4,808 | 0.0 | 2,445 | 0.0 |
| 18x4.19F | 12,320 | 0.1 | 16,129 | 0.2 |
| 19x2.15B | 11,586 | 0.1 | 6,671 | 0.1 |
| 19x2.75D | ..... | ... | 3,442 | 0.1 |
| 19x3.00D | 39,624 | 0.4 | 42,932 | 0.6 |
| 19x3.25E | 1,410 | 0.0 | ..... | ... |
| 19x3.62F | ..... | ... | 11 | 0.0 |
| 20x3.25E | 963 | 0.0 | 747 | 0.0 |
| 21x2.75D | ..... | ... | 484 | 0.0 |
| 21x3.25E | 7,028 | 0.1 | 22 | 0.0 |

| Rim Size | 9 Mos., 1934 No. | % | 9 Mos., 1933 No. | % |
|---|---|---|---|---|
| **Flat Base Balloon** | | | | |
| 17x4 | 1,640 | 0.0 | 2,011 | 0.0 |
| 17x4½ | ..... | ... | 50 | 0.0 |
| 17x5 | 7,145 | 0.1 | 6,302 | 0.1 |
| 18x3.00D | 1,005 | 0.0 | ..... | ... |
| 18x3.25E | 1,459 | 0.0 | 243 | 0.0 |
| 18x4 | 4,909 | 0.0 | 3,715 | 0.1 |
| 18x4½ | 167 | 0.0 | 460 | 0.0 |
| 18x5 | 1,401 | 0.0 | 6,465 | 0.1 |
| 19x2.75D | 7,230 | 0.1 | 5,840 | 0.1 |
| 19x3.00D | 3,053 | 0.0 | 988 | 0.0 |
| 19x3.25E | ..... | ... | 717 | 0.0 |
| 19x3½ | 519 | 0.0 | ..... | 0.0 |
| 19x4 | 12,199 | 0.1 | 13,531 | 0.3 |
| 19x4½ | 5,296 | 0.1 | 2,328 | 0.0 |
| 19x5 | 3,213 | 0.0 | 1,606 | 0.0 |
| 19x6 | 176 | 0.0 | 51 | 0.0 |
| 20x2.75D | 8,097 | 0.1 | 11,535 | 0.2 |
| 20x3½ | 5,346 | 0.1 | 1,942 | 0.0 |
| 20x4 | 2,638 | 0.0 | 3,678 | 0.1 |
| 20x4½ | 4,703 | 0.0 | 3,924 | 0.1 |
| 20x5 | 23,058 | 0.2 | 6,733 | 0.1 |
| 20x6 | 3,932 | 0.0 | ..... | ... |
| 21x2.75D | 345 | 0.0 | 2,437 | 0.0 |
| 21x3½ | 19,054 | 0.2 | 5,798 | 0.1 |
| 21x4 | 2,256 | 0.0 | 1,961 | 0.0 |
| 21x4½ | 6,188 | 0.1 | 5,894 | 0.1 |
| 21x5 | 361 | 0.0 | 205 | 0.0 |
| 21x6 | 521 | 0.0 | 338 | 0.0 |
| **High Pressure** | | | | |
| 30x3½ | 3,996 | 0.0 | 2,118 | 0.0 |
| 32x4 | 520 | 0.0 | 201 | 0.0 |
| 32x4½ | 619 | 0.0 | 806 | 0.0 |
| 34x4½ | 208 | 0.0 | 418 | 0.0 |
| **18" Truck Rims** | | | | |
| 18x5 | 630 | 0.0 | 284 | 0.0 |
| 18x6 | 141 | 0.0 | ..... | ... |

| Rim Size | 9 Mos., 1934 No. | % | 9 Mos., 1933 No. | % |
|---|---|---|---|---|
| 18x7 | 24,311 | 0.2 | 5,027 | 0.1 |
| 18x8 | 1,754 | 0.0 | 484 | 0.0 |
| **20" Truck Rims** | | | | |
| 20x5 | 1,543,728 | 15.5 | 1,132,013 | 16.0 |
| 20x6 | 674,334 | 6.8 | 248,843 | 3.5 |
| 20x7 | 154,631 | 1.6 | 103,795 | 1.5 |
| 20x8 | 65,164 | 0.7 | 50,564 | 0.7 |
| 20x9/10 | 9,507 | 0.1 | 4,792 | 0.1 |
| 20x10.50 | 701 | 0.0 | 202 | 0.0 |
| 20x11 | 474 | 0.0 | 432 | 0.0 |
| **22" Truck Rims** | | | | |
| 22x7 | 1,444 | 0.0 | 1,869 | 0.0 |
| 22x8 | 12,241 | 0.1 | 9,597 | 0.1 |
| 22x9/10 | 5,358 | 0.1 | 2,129 | 0.0 |
| **24" Truck Rims** | | | | |
| 24x5 | 54 | 0.0 | ..... | ... |
| 24x6 | 4,140 | 0.0 | 3,583 | 0.1 |
| 24x7 | 12,362 | 0.1 | 6,366 | 0.1 |
| 24x8 | 16,389 | 0.2 | 15,918 | 0.2 |
| 24x9/10 | 9,108 | 0.1 | 7,346 | 0.1 |
| 24x11 | 740 | 0.0 | 168 | 0.0 |
| **Drop Center Tractor Rims** | | | | |
| 24x6.00S | 3,339 | 0.0 | 132 | 0.0 |
| 24x8.00T | 14,518 | 0.1 | 4,162 | 0.1 |
| 28x8.00T | 4,226 | 0.0 | 1,462 | 0.0 |
| 36x6.00S | 9,313 | 0.1 | 1,579 | 0.0 |
| 36x8.00T | 643 | 0.0 | ..... | ... |
| **Motorcycle Clincher** | | | | |
| 24x3 | 201 | 0.0 | 593 | 0.0 |
| **Automobile Clincher** | | | | |
| 30x3½ | 5,480 | 0.1 | 6,181 | 0.1 |
| **Airplane** | | | | |
| 18x3DC | 474 | 0.0 | 9 | 0.0 |
| Totals | 9,928,288 | ... | 7,057,748 | ... |

## Low and High New York Spot Prices

| | October 1934* | October 1933 | October 1932 |
|---|---|---|---|
| PLANTATIONS | | | |
| Thin latex crepe, No. 1 | 14¼/15½ | 7¾/8⅞ | 3⅞/4⅛ |
| Smoked sheet, No. 1 ribbed | 13½/14½ | 6⅞/8 | 3 1/16/3 1/16 |
| PARAS | | | |
| Upriver fine | 10¼/10¾ | 8 /9¼ | 7¼/7¾ |

* Figured to October 26, 1934. All prices in cents per pound.

## Imports by Customs Districts

| | August, 1934 *Crude Rubber Pounds | Value | August, 1933 *Crude Rubber Pounds | Value |
|---|---|---|---|---|
| Massachusetts | 8,729,634 | $1,024,006 | 11,780,272 | $629,783 |
| Buffalo | 2,746 | 275 | ..... | ..... |
| New York | 52,462,992 | 5,938,584 | 76,720,994 | 4,258,655 |
| Philadelphia | 968,881 | 106,487 | 1,019,391 | 41,960 |
| Maryland | 4,413,477 | 475,928 | 6,874,321 | 344,551 |
| New Orleans | 1,131,905 | 100,619 | 67,243 | 2,648 |
| Los Angeles | 5,302,864 | 572,946 | 4,753,894 | 282,099 |
| San Francisco | 147,740 | 16,082 | 325,854 | 18,283 |
| Oregon | 33,600 | 2,943 | ..... | ..... |
| Washington | 11,200 | 990 | ..... | ..... |
| Ohio | 41,927 | 4,165 | 69,863 | 4,650 |
| Colorado | ..... | ..... | 114,240 | 5,218 |
| Totals | 73,246,966 | $8,243,025 | 101,726,072 | $5,587,847 |

*Crude rubber including latex dry rubber content.

## World Rubber Shipments—Net Exports

| | Long Tons—1934 July | Aug. | Sept. |
|---|---|---|---|
| British Malaya | | | |
| Gross exports | 53,335 | 52,641 | 61,051 |
| Imports | 22,829 | 17,865 | 17,889 |
| Net | 30,506 | 34,776 | 43,162 |
| Ceylon | 3,818 | *5,369 | *6,632 |
| India and Burma | 710 | 552 | .... |
| Sarawak | 1,662 | 1,714 | 1,438 |
| British N. Borneo | 1,048 | 1,048 | 839 |
| Siam | 2,399 | 1,908 | 1,626 |
| Java and Madura | 5,762 | 5,340 | .... |
| Sumatra E. Coast | 7,408 | 8,902 | .... |
| Other N. E. Indies | 14,182 | 10,902 | .... |
| French Indo-China | *1,703 | *1,610 | *1,665 |
| Amazon Valley | 353 | 710 | .... |
| Other America | *25 | *25 | .... |
| Guayule | .... | 98 | .... |
| Africa | *300 | *300 | *300 |
| Totals | 69,876 | 73,254 | .... |

*Estimate. *Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.*

## Rubber Goods Production Statistics

| | 1934 July | 1933 July |
|---|---|---|
| TIRES AND TUBES* | | |
| Pneumatic casings | | |
| Production ..... *thousands* | 3,252 | 4,571 |
| Shipments, total ..... *thousands* | 4,033 | 4,398 |
| Domestic ..... *thousands* | 3,954 | 4,324 |
| Stocks, end of month ..... *thousands* | 9,154 | 5,475 |
| Solid and cushion tires | | |
| Production ..... *thousands* | 18 | 15 |
| Shipments, total ..... *thousands* | 18 | 14 |
| Domestic ..... *thousands* | 17 | 13 |
| Stocks, end of month ..... *thousands* | 30 | 21 |
| Inner tubes | | |
| Production ..... *thousands* | 3,425 | 4,482 |
| Shipments, total ..... *thousands* | 4,193 | 4,169 |
| Domestic ..... *thousands* | 4,133 | 4,110 |
| Stocks, end of month ..... *thousands* | 7,812 | 5,152 |
| Raw material consumed | | |
| Fabrics ..... *thous. of lbs.* | 13,267 | 18,709 |
| MISCELLANEOUS PRODUCTS | | |
| Rubber bands, shipments ..... *thous. of lbs.* | 220 | 307 |
| Rubber clothing, calendered | | |
| Orders, net ..... *no. of coats and sundries* | .... | 10,550 |
| Production ..... *no. of coats and sundries* | .... | 38,451 |
| Rubber-proofed fabrics, production, total ..... *thous. of yds.* | .... | 5,992 |
| Auto fabrics ..... *thous. of yds.* | 526 | 584 |
| Raincoat fabrics ..... *thous. of yds.* | .... | 3,301 |
| Rubber flooring, shipments ..... *thous. of sq. ft.* | .... | 255 |
| Rubber and canvas footwear | | |
| Production, total ..... *thous. of prs.* | .... | 3,824 |
| Tennis ..... *thous. of prs.* | .... | 1,496 |
| Waterproof ..... *thous. of prs.* | .... | 2,327 |
| Shipments, total ..... *thous. of prs.* | .... | 4,333 |
| Tennis ..... *thous. of prs.* | .... | 2,251 |
| Waterproof ..... *thous. of prs.* | .... | 2,082 |
| Shipments, domestic, total ..... *thous. of prs.* | .... | 4,253 |
| Tennis ..... *thous. of prs.* | .... | 2,181 |
| Waterproof ..... *thous. of prs.* | .... | 2,072 |
| Stocks, total, end of month ..... *thous. of prs.* | .... | 13,517 |
| Tennis ..... *thous. of prs.* | .... | 3,832 |
| Waterproof ..... *thous. of prs.* | .... | 9,685 |
| Rubber heels | | |
| Production ..... *thous. of prs.* | 15,903 | 21,496 |
| Shipments, total ..... *thous. of prs.* | 15,656 | 20,116 |
| Export ..... *thous. of prs.* | 346 | 293 |
| Repair trade ..... *thous. of prs.* | 4,485 | 6,184 |
| Shoe manufactures ..... *thous. of prs.* | 10,825 | 13,638 |
| Stocks, end of month ..... *thous. of prs.* | 38,997 | 19,861 |
| Rubber soles | | |
| Production ..... *thous. of prs.* | 3,082 | 5,154 |
| Shipments, total ..... *thous. of prs.* | 3,277 | 5,024 |
| Export ..... *thous. of prs.* | 2 | 4 |
| Repair trade ..... *thous. of prs.* | 290 | 436 |
| Shoe manufactures ..... *thous. of prs.* | 2,984 | 4,584 |
| Stocks, end of month ..... *thous. of prs.* | 4,933 | 2,333 |
| Mechanical rubber goods, shipments | | |
| Total ..... *thous. of dollars* | .... | 4,191 |
| Belting ..... *thous. of dollars* | .... | 1,187 |
| Hose ..... *thous. of dollars* | .... | 1,428 |
| Other ..... *thous. of dollars* | .... | 1,575 |

*Data for 1934 are estimated to represent approximately 97% of the industry.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

## United States Statistics

### Imports for Consumption of Crude and Manufactured Rubber

| | June, 1934 | | Six Months Ended June, 1934 | |
|---|---|---|---|---|
| UNMANUFACTURED—*Free* | Pounds | Value | Pounds | Value |
| Crude rubber | 105,928,197 | $10,747,464 | 589,212,422 | $48,412,456 |
| Liquid latex | 3,266,318 | 421,317 | 16,450,785 | 1,801,680 |
| Jelutong or pontianak | 869,702 | 71,672 | 6,560,155 | 582,009 |
| Balata | 187,508 | 49,881 | 1,491,837 | 297,675 |
| Gutta percha | 364,502 | 44,290 | 1,957,245 | 197,777 |
| Guayule | 111,500 | 9,422 | 671,500 | 56,742 |
| Scrap and reclaimed, etc. | 848,379 | 7,635 | 5,107,449 | 43,083 |
| Totals | 111,576,106 | $11,351,681 | 621,451,393 | $51,391,422 |
| Chicle, crude—*Free* | 292,072 | $82,493 | 3,443,651 | $802,650 |
| MANUFACTURED—*Dutiable* | | | | |
| Rubber soled footwear with fabric uppers—*pairs* | 100,526 | $22,063 | 834,965 | $238,471 |
| Rubber toys | ..... | 26,200 | ..... | 150,823 |
| Druggists' sundries, n. e. s. | ..... | 7,433 | ..... | 39,725 |
| Combs, hard rubber—*number* | 88,126 | 5,181 | 765,938 | 35,347 |
| Golf balls—*number* | 75,756 | 19,387 | 321,890 | 80,654 |
| Tennis and other rubber balls—*number* | 110,356 | 14,704 | 1,435,640 | 105,595 |
| Tires—*number* | 788 | 994 | 4,589 | 13,803 |
| Other rubber manufactures | ..... | 48,142 | ..... | 244,304 |
| Totals | ..... | $144,104 | ..... | $908,722 |

### Exports of Foreign Merchandise

| | | | | |
|---|---|---|---|---|
| RUBBER AND MANUFACTURES | | | | |
| Crude rubber | 4,505,844 | $501,499 | 31,961,649 | $3,045,825 |
| Balata | 10,651 | 2,865 | 65,287 | 17,477 |
| Guayule | ..... | ..... | 16,800 | 1,419 |
| Gutta percha, rubber substitutes, and scrap | 7 | 3 | 1,942 | 706 |
| Rubber manufactures | ..... | 3,898 | ..... | 10,680 |
| Totals | ..... | $508,265 | ..... | $3,076,107 |

### Exports of Domestic Merchandise

| | | | | |
|---|---|---|---|---|
| RUBBER AND MANUFACTURES | | | | |
| Reclaimed | 993,803 | $50,508 | 5,297,135 | $249,091 |
| Scrap | 2,878,608 | 80,270 | 20,549,122 | 426,533 |
| Rubberized automobile cloth, *sq. yd.* | 77,213 | 47,780 | 393,778 | 207,355 |
| Other rubberized piece goods and hospital sheetings—*sq. yd.* | 55,540 | 23,250 | 367,152 | 158,856 |
| Footwear | | | | |
| Boots—*pairs* | 3,174 | 7,038 | 26,213 | 64,543 |
| Shoes—*pairs* | 8,185 | 4,760 | 95,736 | 46,974 |
| Canvas shoes with rubber soles—*pairs* | 31,922 | 16,645 | 87,701 | 55,017 |
| Soles—*doz. pairs* | 1,828 | 3,998 | 21,842 | 32,743 |
| Heels—*doz. pairs* | 26,412 | 14,632 | 171,667 | 91,345 |
| Water bottles and fountain syringes—*number* | 13,114 | 6,166 | 91,719 | 33,701 |
| Gloves—*doz. pairs* | 4,848 | 11,405 | 28,126 | 58,523 |
| Other druggists' sundries | ..... | 27,449 | ..... | 174,418 |
| Balloons—*gross* | 14,484 | 15,054 | 103,432 | 94,557 |
| Toys and balls | ..... | 3,455 | ..... | 17,619 |
| Bathing caps—*doz.* | 5,771 | 11,364 | 64,643 | 115 824 |
| Bands | 31,894 | 10,912 | 158,350 | 51,062 |
| Erasers | 29,959 | 17,063 | 158,064 | 85,493 |
| Hard rubber goods | | | | |
| Electrical goods | 97,109 | 11,634 | 565,059 | 61,493 |
| Other goods | ..... | 7,790 | ..... | 74,864 |
| Tires | | | | |
| Truck and bus casings, *number* | 38,045 | 579,791 | 164,020 | 2,493,716 |
| Other automobile casings, *number* | 75,321 | 520,419 | 444,953 | 2,999,933 |
| Tubes, auto—*number* | 81,111 | 89,896 | 407,680 | 445,358 |
| Other casings and tubes, *number* | 4,754 | 11,174 | 24,227 | 63,908 |
| Solid tires for automobiles and motor trucks—*number* | 1,011 | 23,710 | 3,880 | 104,287 |
| Other solid tires | 102,492 | 12,945 | 771,636 | 97,842 |
| Tire sundries and repair materials | ..... | 36,661 | ..... | 197,424 |
| Rubber and friction tape | 45,126 | 11,478 | 285 564 | 74,189 |
| Belting | 163,845 | 83,349 | 1,148,072 | 510,078 |
| Hose | 465,771 | 122,060 | 2,127,915 | 588,575 |
| Packing | 76 473 | 30,623 | 519,234 | 212,695 |
| Thread | 117,553 | 67,549 | 676,960 | 405,143 |
| Other rubber manufactures | ..... | 122,135 | ..... | 629,337 |
| Totals | ..... | $2,082,963 | ..... | $10,922,496 |

## London Stocks, August, 1934

| | | | Stocks, August 31 | | |
|---|---|---|---|---|---|
| LONDON | Landed Tons | Delivered Tons | 1934 Tons | 1933 Tons | 1932 Tons |
| Plantation | 8,289 | 9,857 | 48,870 | 39,434 | 47,010 |
| Other grades | 31 | .. | 83 | 46 | 69 |
| LIVERPOOL | | | | | |
| Plantation | *2,328 | *1,496 | *56,246 | *57,143 | *57,236 |
| Total tons, London and Liverpool | 10,648 | 11,353 | 105,199 | 96,623 | 104,315 |

*Official returns from the recognized public warehouses.

## Dominion of Canada Statistics

### Imports of Crude and Manufactured Rubber

| | June, 1934 | | Three Months Ended June, 1934 | |
|---|---|---|---|---|
| UNMANUFACTURED | Pounds | Value | Pounds | Value |
| Crude rubber, etc. | 4,946,790 | $586,391 | 15,332,599 | $1,782,771 |
| Gutta percha | 1,620 | 1,884 | 4,735 | 5,422 |
| Rubber, recovered | 395,600 | 17,312 | 1,894,600 | 83,261 |
| Rubber, powdered, and gutta percha scrap | 237,000 | 2,383 | 840,700 | 23,081 |
| Balata | 2,182 | 568 | 3,206 | 1,950 |
| Rubber substitute | 36,900 | 11,470 | 135,000 | 33,320 |
| Totals | 5,620,092 | $620,008 | 18,210,840 | $1,929,805 |
| PARTLY MANUFACTURED | | | | |
| Hard rubber sheets and rods | 806 | $557 | 2,660 | $2,116 |
| Hard rubber tubes | ..... | 177 | ..... | 1,112 |
| Rubber thread not covered | 4,284 | 2,995 | 18,792 | 13,383 |
| Totals | 5,090 | $3,729 | 21,452 | $16,611 |
| MANUFACTURED | | | | |
| Belting | ..... | $6,320 | ..... | $20,077 |
| Hose | ..... | 9,795 | ..... | 23,471 |
| Packing | ..... | 4,434 | ..... | 14,119 |
| Boots and shoes—*pairs* | 2,454 | 894 | 49,726 | 12,309 |
| Clothing, including waterproofed | ..... | 4,255 | ..... | 9,278 |
| Raincoats—*number* | 193 | 861 | 2,676 | 8,251 |
| Gloves—*dozen pairs* | 424 | 908 | 1,386 | 2,822 |
| Hot water bottles | ..... | ..... | ..... | 636 |
| Tires, bicycle—*number* | 2,372 | 1,124 | 14,007 | 5,871 |
| Pneumatic—*number* | 1,831 | 23,794 | 6,699 | 71,493 |
| Inner tubes—*number* | 266 | 1,018 | 1,481 | 3,255 |
| Solid for automobiles and motor trucks—*number* | 26 | 709 | 136 | 3,747 |
| Other solid tires | ..... | 638 | ..... | 1,804 |
| Mats and matting | ..... | 4,396 | ..... | 22,299 |
| Cement | ..... | 8,257 | ..... | 26,738 |
| Golf balls—*dozen* | 5,938 | 16,882 | 15,662 | 45,431 |
| Heels—*pairs* | 7,127 | 345 | 26,764 | 1,395 |
| Other rubber manufactures | ..... | 66,743 | ..... | 188,391 |
| Totals | ..... | $151,373 | ..... | $461,387 |
| Totals, rubber imports | ..... | $775,110 | ..... | $2,407,803 |

### Exports of Domestic and Foreign Rubber Goods

| | Produce of Canada Value | Reexports of Foreign Goods Value | Produce of Canada Value | Reexports of Foreign Goods Value |
|---|---|---|---|---|
| UNMANUFACTURED | | | | |
| Waste rubber | $4,844 | ..... | $17,341 | ..... |
| MANUFACTURED | | | | |
| Belting | $31,774 | ..... | $85,824 | ..... |
| Canvas shoes with rubber soles | 161,143 | ..... | 570,514 | ..... |
| Boots and shoes | 125,940 | ..... | 252,442 | ..... |
| Clothing, including waterproofed | 12,785 | ..... | 35,631 | ..... |
| Heels | 10,058 | ..... | 28,799 | ..... |
| Hose | 16,435 | ..... | 40,924 | ..... |
| Soles | 12,388 | ..... | 45,046 | ..... |
| Tires, bicycle | ..... | ..... | ..... | ..... |
| Pneumatic | 550,139 | ..... | 1,564,640 | ..... |
| Inner tubes | 48,946 | ..... | 126,007 | ..... |
| Solid | ..... | ..... | 127 | ..... |
| Other rubber manufactures | 54,098 | $727 | 192,551 | $8,548 |
| Totals | $1,023,706 | $727 | $2,942.505 | $8,548 |
| Totals, rubber exports | $1,028,550 | $727 | $2,959,846 | $8,548 |

## World Rubber Absorption—Net Imports

| | Long Tons—1934 | | | |
|---|---|---|---|---|
| CONSUMPTION | May | June | July | Aug. |
| United States | 44,462 | 41,146 | 33,747 | 34,058 |
| United Kingdom | 9,706 | 13.045 | 6,010 | 14,427 |
| NET IMPORTS | | | | |
| Australia | 769 | 1,512 | 732 | 658 |
| Austria | 338 | 339 | 160 | ... |
| Belgium | 214 | 837 | 810 | 669 |
| Canada | 2,218 | 2,208 | 2,430 | 1,948 |
| Czechoslovakia | 1,768 | 1,624 | 1,094 | 1,519 |
| Denmark | 180 | 214 | 146 | 266 |
| Finland | 90 | 171 | 277 | 226 |
| France | 3.634 | 3,803 | 4,051 | 3,774 |
| Germany | 6,499 | 6,171 | 5,494 | 3,078 |
| Italy | 2,207 | 1,897 | 708 | ... |
| Japan | 6,905 | 6,745 | 5,739 | 4,945 |
| Netherlands | 322 | 331 | 540 | 239 |
| Norway | 65 | 52 | 82 | 68 |
| Russia | 4,360 | 3,145 | 1,640 | ... |
| Spain | 147 | 1,146 | 747 | ... |
| Sweden | 605 | 406 | 1,077 | 473 |
| Switzerland | 194 | 142 | 104 | 162 |
| Others | *2,250 | *2,250 | *2 250 | *2,250 |
| Totals | 86.933 | 87,184 | 67,838 | ... |
| Minus United States (Cons.) | 44,462 | 41,146 | 33,747 | 34,058 |
| Total foreign | 42,471 | 46,038 | 34,091 | ... |

*Estimate. *Compiled by Leather-Rubber-Shoe Division, Department of Commerce, Washington, D. C.*